# STATE OF CONNECTICUT


# THE NUCLEAR ENERGY ADVISORY COUNCIL REPORT

# 2012

**Established Pursuant to Public Act 96-245**

**John W. Sheehan, Chairperson**
**Pearl Rathbun, Vice Chairperson**

**December 6, 2012**

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## CHARGE TO THE COUNCIL

Section 17 of Public Act 96-245 created the Nuclear Energy Advisory Council (NEAC) and requires it to:

1. Hold regular public meetings to discuss issues relating to the safety and operations of nuclear power plants and to advise the governor, legislature, and municipalities within a five-mile radius of the plants on these issues;

2. Work with federal, state, and local agencies and the companies operating such plants to ensure public health and safety;

3. Discuss proposed changes in, or problems arising from, the operation of the plants;

4. Communicate, through reports and presentations, with the plants' operators about safety or operational concerns at the plants, and

5. Review the current status of the plants with the Nuclear Regulatory Commission.

## COUNCIL MEMBERS

The Council consisted of twelve (12) members appointed by the Governor, legislative leadership, and the executive bodies in the towns in or near which the state's nuclear power plants are located (Appendix 1).

## EXECUTIVE SUMMARY

This is the seventeenth annual report presented by the Nuclear Energy Advisory Council (NEAC). During calendar year (CY) 2012, the NEAC met four times and received reports from representatives of the Nuclear Regulatory Commission (NRC), Dominion Nuclear Connecticut and Connecticut Academy of Science and Engineering (CASE) who discussed the Future of Nuclear Power in Connecticut. Routine NRC Millstone Power Station (MPS) inspection and performance assessment reports were also received and reviewed. During the fourth quarter of 2011, Millstone Unit 3 plant performance (Action Matrix) was classified as "GREEN", meaning that all inspection findings for CY 2011 were classified as having no or low safety significance, Millstone Unit 2 had one finding in the second quarter of 2011 that had a low to moderate safety significance (WHITE) in the Initiating Events Cornerstone. This meant that Unit 2 would have supplemental inspections in 2012 while Unit 3 would have baseline inspections in 2012. In the first quarter of 2012 there were no NRC-identified or self-revealing findings during the integrated inspections for either Millstone 2 or Millstone 3. Millstone 3 remained in the GREEN classification and Unit 2 remained in the WHITE status due to the incident in 2011. During the second quarter, there was one NRC-identified finding of very low safety significance and one finding of very low safety significance identified by the licensee. In the third quarter there was one NRC-identified finding and one licensee revealed finding, both of very low safety significance. Results for the fourth quarter 2012 were not available at the time of this report. Because of the “GREEN” status, only routine baseline inspections were initially scheduled by the NRC of Millstone 3 in CY 2012. As noted above Millstone 2 would have a supplemental inspection due to the WHITE finding in the second quarter of 2011. Included in those baseline inspections were a Millstone Station Security Baseline Inspection, an Audit of the licensee’s management of regulatory commitments, Material Control and Accounting Programs, Emergency Preparedness Annual Inspection, NRC Component Design Bases Inspection, Unit 1 safety and compliance, and Problem Identification and Resolution Inspection. There were five findings in the reported baseline inspections. On February 12, 2011, Millstone 2 experienced an unanticipated reactor power transient during main turbine control valve testing. This incident prompted a special inspection by the NRC and a resulting WHITE finding which resulted in a supplemental inspection in September 2012 that identified one new performance issue of low safety significance in Millstone 2 Special Inspections were also conducted as a result of the Fukushima Daiichi Accident in the area of Severe Accident Management Guidelines. The final report in June 2012 concluded that Millstone Power Station had completed all of the requirements of the “Mitigating Strategies” Bulletin issued in June 2011 and “…no further actions under the bulletin are needed.” On June 4, 2012, the NRC closed an investigation report regarding failure of a contract employee to report an arrest immediately following the arrest. Since MPS terminated the contractor’s employment, the NRC did not take any enforcement action against MPS. In a November 16, 2012 letter the NRC reported on the evaluation of an August 24, 2012 Emergency Preparedness Exercise noting one finding of very low safety significance (GREEN).

Scheduled decommissioning activities of the industrial areas at Connecticut Yankee Atomic Power Company (CYAPCO) are complete. The Connecticut Yankee Site with the exception of the Spent Fuel Dry Cask Storage Area was released for unrestricted use on November 26, 2007. Final decommissioning and license termination of the entire site will be completed after removal of spent nuclear fuel (SNF) and greater than Class C (GTCC) radioactive waste that is in dry cask storage. The Connecticut Department of Energy and Environmental Protection (DEEP) conducts radiological environmental monitoring and groundwater monitoring programs and the NRC conducts an annual safety/security inspection of the Independent Spent Fuel Storage Installation (ISFSI).

## COUNCIL ACTIVITIES IN 2012

**MEETINGS:**

As required by PA 96-245, the NEAC held four public meetings as follows: (1) February 2, 2012, (2) April 19, 2012 , (3) July 19, 2012; and (4) December 6, 2012 at Waterford Town Hall, Waterford, CT. The purpose of these meetings was to provide a venue for discussion of issues relating to the safe operation of the state's nuclear power plants. Meeting minutes are included in Appendix 2. A summary of the meetings follows:

February 2, 2012: Presentation by CASE regarding the Future of Nuclear Power in Connecticut. This was the same presentation that had been originally presented to the Connecticut Energy Advisory Board in December 2011. The report made a number of recommendations for future actions by the State regarding nuclear power.

April 19, 2012: This was a joint meeting with the NRC Region I and focused on the Annual Assessment Report of Millstone Power Station Units 2 and 3 for the four quarters of CY2011 It was reported that overall these two units were operated in a manner that preserved public health and safety and Unit 3 fully met NRC cornerstone objectives. Unit 3 would have baseline inspections. Due to the plant event in February 2011, Unit 2 was in the Regulatory Response Column and would have some additional inspections until the corrective actions related to the February 2011 incident were completed.

July 19, 2012: Dominion Nuclear Connecticut representatives provided a station update following a tour of Millstone Power Station. Some recommendations of the CASE study were endorsed by NEAC. Appendix 3 is a listing of the CASE Study Recommendations that were endorsed by NEAC. Recent Millstone Station inspection results correspondence received from the NRC was also discussed.

December 6, 2012: The CY2012 Annual Report was discussed, reviewed, and approved for promulgation. NRC Correspondence and Inspection Results received since the last meeting were discussed. The meeting schedule for CY2013 was approved and possible topics for the meetings were discussed.

Millstone 1 Decommissioning Advisory Committee (M1DAC): Since Millstone 1 remains in Safe Storage (SAFSTORE) and no significant activities were conducted at the Unit during the past calendar year, M1DAC did not meet in CY2012.

## REPORT ON ISSUES

### MILLSTONE OPERATIONS

As reported by the Nuclear Regulatory Commission (NRC) in regular inspection reports and at a Joint Public Meeting (Appendix 2), Millstone Units 2 and 3 have continued to be operated in a manner that preserves public health and safety. One WHITE finding was documented on a Special Inspection of Unit 2 completed on April 14, 2011 as a result of an unintended eight percent reactor power transient during the performance of quarterly main turbine control valve testing on February 12, 2011. This WHITE finding carried over into 2012, resulting in additional inspections for Unit 2 during 2012.

Routine inspections conducted between October 1, 2011 and September 30, 2012 resulted in the identification of two Unit 2 issues, and two Unit 3 issues, all were determined to be of very low safety significance (GREEN). An NRC Security Baseline Inspection was completed on December 1, 2011 No findings were identified in the December 22, 2011 report of the inspection. On December 31, 2011, the NRC completed its annual inspection of the Emergency Preparedness Program. The inspection started on January 1, 2011. Observations and findings were provided in separate correspondence not available to the public. On November 15 and 16, 2011 the NRC conducted an audit of Dominion's Management of Regulatory Comments. In the December 28, 2011 letter reporting the results of the audit, it was noted that "although the procedure itself is adequate, there have been numerous problems with adherence to the procedure" and the "…commitment management program has not been effective with respect to: tracking regulatory commitments; reporting to the NRC; and managing changes to commitments" There were no findings identified during the January 24, 2012 inspection of the Material Control and Accounting Program or the February 9, 2012 Baseline Security Inspection. One NRC identified finding of very low safety significance was reported in the June 20, 2012 report of the Component Design Bases Inspection conducted on May 11, 2012. Three NRC identified findings of very low safety significance were found during the August 2, 2012 Problem Identification and Resolution Inspection reported on August 31, 2012. There was one special investigation to determine if a contract employee deliberately failed to report an arrest on unescorted access authorization records to gain unescorted access to Millstone Station. The action of one employee was determined to be deliberate. Since the employee was terminated with the record reflecting an unfavorable termination, the NRC did not take any enforcement action. On September 13, 2012 the NRC completed the supplemental inspection initiated by the WHITE finding resulting from the February 12, 2011 incident at Unit 2. According to the report, in the period between the special inspection in April 2011 and the supplemental inspection in September 2012 "Dominion had two additional relevant events (June 2011 and November 2011) involving human performance, that provided additional data to assess the effectiveness of corrective actions taken for the February 2011 event. The November

2011 event was determined by Dominion to be a repeat of the event of February 2011, with the exception that the event occurred in Unit 3." The corrective actions taken in regards to the three events were considered reasonable to address the related performance issues and the WHITE finding will be closed. On November 16, 2012, the NRC released a report of the August 24, 2012 NRC Evaluated Emergency Preparedness Exercise noting one NRC identified finding of very low safety significance (GREEN) regarding procedures for sampling reactor coolant once a safety injection signal has occurred. The NRC had not released the results of the fourth quarter 2012 inspections at the close out time of this report.

## DECOMMISSIONING

### MILLSTONE 1

In July of 1998, it was announced that Millstone Unit 1 would undergo decommissioning. A modified Safe Storage (SAFSTOR) decommissioning option was selected and remains in effect. This involved some decontamination and dismantlement early in the process. After these initial activities were completed, the unit was then placed in safe storage until the other two units at the Millstone site undergo decommissioning. After reviewing Unit 1 requirements, in conjunction with the operational and outage requirements of Millstone Units 2 and 3, it was strategically decided to place Unit 1 in 'Cold and Dark' storage in April 2001. This allowed the safe and efficient separation (from Units 2 and 3) projects as well as the decommissioning projects. All separation projects were completed by April 1, 2001.

No findings of safety significance were found during the inspection of Unit 1 on June 25-27, 2012 and reported on July 6, 2012

### CONNECTICUT YANKEE

The Connecticut Yankee Atomic Power Company (CYAPCO) plant began commercial operation in 1968 and produced more than 110 billion kilowatt-hours of electricity during its 28-year operating history. In 1996, the CYAPCO Board of Directors voted to permanently close and decommission the power plant. After two years of planning and preparation, actual decommissioning began in 1998 and was completed in 2007. CYAPCO has operated the NRC licensed Independent Spent Fuel Storage Installation (ISFSI) at the Haddam Neck site since 2004. The spent nuclear fuel and GTCC waste at the ISFSI facility is stored in 43 dry casks containing dual purpose canisters licensed by the NRC for both storage and transportation. The generic storage license for the dry cask storage system expires in 2020. The U.S. Department of Energy is obligated under the Nuclear Waste Policy Act and by contract with CYAPCO to remove and dispose of this waste.

Current Status

Normal activities continue at the ISFSI.

An upgrade to security equipment project was completed on September 11, 2012.

The ISFSI concrete pad Phase I surface repair plan is progressing. An engineering evaluation will be prepared that will address the current situation and the plans for repair going forward. The most likely scenario for short-term construction activities will involve a repair plan to a section of the pad which will be implemented next Spring when the weather is more conducive to concrete construction activities.

The work for the new storage building has been awarded to Manafort Brothers who will act as the General Contractor and project manager. Permits have been approved and work has begun on the buildings.

The biennial Emergency Plan exercise was successfully completed on September 27, 2012.

Connecticut Yankee has submitted an exemption request from some elements of the recently revised Emergency Planning Rule. By letter dated August 10, 2012, the exemption request has been accepted by NRC for detailed evaluation. The completion of their review of the exemption request is expected in late summer 2013.

The Groundwater Monitoring Plan includes sixty-two (62) sampling locations from fifty-nine (59) wells. The third quarter groundwater sampling was completed in late September 2012. Preliminary results for chemical constituents for all wells sampled were below state criteria. Preliminary radiation data is not available for the wells sampled at this time. A meeting was held with the Connecticut DEEP on October 10, 2012 to discuss the annual groundwater report and future well closures. The DEEP was satisfied with the annual report and concurred that eight additional wells can be closed.

DEEP oversight continues with site inspections, environmental radiological monitoring, and groundwater monitoring, and briefings on the monitoring programs sample results.

The Connecticut Yankee Fuel Storage Advisory Committee held one meeting this year on May 15, 2012. The committee plans to meet again in the spring of 2013.

## HIGH LEVEL NUCLEAR WASTE

- NEAC continued to monitor activity to establish a permanent solution for spent nuclear fuel disposal. In view of the fact that there are now two nuclear plants currently decommissioned in Connecticut, failure to establish a permanent repository or otherwise dispose of the spent nuclear fuel and high level waste could adversely affect the State's economy and homeland security. It is noted that temporary storage of spent fuel in dry cask storage containers has been implemented at both Millstone and Connecticut Yankee.

The President's Blue Ribbon Committee Report was submitted to the Secretary of Energy on January 26, 2012 with eight key recommendations to reform the spent nuclear fuel management program. Some of these recommendations will require legislation by Congress and the President. NEAC will continue to monitor the progress toward a solution to the problem of High Level Nuclear Waste.

## RECOMMENDATIONS

### STATE

1. Department of Energy and Environmental Protection should continue to address any emergency preparedness issues at Connecticut's nuclear sites.
2. Department of Energy and Environmental Protection should continue to address any security issues at Connecticut's nuclear sites.
3. Department of Energy and Environmental Protection should continue radiological and environmental monitoring of Connecticut's nuclear sites.
4. The Governor, General Assembly, Department of Energy and Environmental Protection, and NEAC should continue to insist that the NRC continue vigilant oversight of Connecticut Yankee and Millstone Power Station sites for as long as high-level nuclear waste remains on site.
5. The Governor, General Assembly, and DEEP should encourage the federal government to develop a solution to the spent fuel storage problem and urge the federal Executive Branch and Congress to implement the President's Blue Ribbon Commission 2012 Report near term and long term recommendations.
6. The Governor and the General Assembly should seriously consider and act on the recommendations of the CASE Report on the Future of Nuclear Power in Connecticut.

### NEAC

1. Continue to monitor the stability of the Employee Concern Program and Safety Conscious Work Environment and Corrective Action Program at Millstone Power Station.
2. Continue to monitor operations and activities at Millstone Power Station and Connecticut Yankee Site, including the dry cask storage programs.
3. Continue to encourage the development of a solution to the problem of Spent Nuclear Fuel, High Level Waste and Greater Than Class C Low-Level Radioactive Waste and the safe transfer of this nuclear waste from Connecticut.

# Appendix 1

# 2012 Nuclear Energy Advisory Council Membership

## NUCLEAR ENERGY ADVISORY COUNCIL MEMBERSHIP

**John W. (Bill) Sheehan** (**Chair)** Waterford: MBA, Rensselaer Polytechnic. Consultant, former Captain, Nuclear powered submarine.

**Pearl Rathbun (Vice Chair)** Niantic: BA Economics. Eastern Connecticut State University. Former Director of Emergency Management, East Lyme.

**Gerald D. Hicks** Waterford: BS Mechanical Engineering University of Colorado. MS Operations Research/Systems Analysis US Naval Postgraduate School. Retired Navy Captain, former Commanding Officer, Nuclear Powered Submarine, represents Dominion Nuclear Connecticut.

**Marjorie W. DeBold** Haddam: BA Psychology and Child Development, UC Berkeley. Retired teacher, former First Selectman of Haddam.

**Gregg W. Dixon** Niantic: PhD Mechanical Engineering (Nuclear) Stanford University. Retired Professor, Mechanical Engineering, US Coast Guard Academy.

**Thomas A. Nebel** Niantic: BS Industrial Engineering New York Polytechnic University; Retired Monsanto/Solutia - former First Responder & NE HAZMAT Coordinator for company; C.E.R.T. Member Missouri & Connecticut.

**Robert J. Klancko** Woodbridge: BSE Chemical Engineering, UCONN. PE, CSP,Engineering Consultant, member State Emergency Response Commission.

**John Markowicz** Waterford: BS Engineering, US Naval Academy. Economic development director, former chief engineer nuclear powered submarine.

**Rep. Kevin Ryan** Oakdale: OD, Pennsylvania College of Optometry. Legislator, Adjunct Faculty, University of New Haven.

**James Sherrard** Mystic: PhD Nuc. & Mech Eng. MIT/UCONN. Chairman, Nuclear Engineering Technology Department, TRCTC.

**Edward L. Wilds, Jr.** Griswold: PhD Physics, UCONN. Director, Radiation Division, Department of Environmental Protection.

# Appendix 2

# 2012 NEAC Meeting Minutes

**NUCLEAR ENERGY ADVISORY COUNCIL**
# 6:00 PM
# FEBRUARY 2, 2012
# BOARD OF EDUCATION CONFERENCE ROOM
# WATERFORD TOWN HALL
# 15 ROPE FERRY ROAD
# WATEFORD, CT
# SPECIAL MEETING

**MINUTES**

**Members Present**

Mr. Bill Sheehan, Chair
Ms. Pearl Rathbun, Vice Chair
Ms. Marge DeBold
Mr. Denny Hicks
Mr. Robert Klancko
Rep Kevin Ryan
Mr. Tom Nebel
Mr. Gregg Dixon
Dr. Edward Wilds representing Commissioner Esty

1. **Call to Order of Meeting**
   NEAC Chair Sheehan called the meeting to order at 6:02 PM at Waterford Town Hall, Waterford, CT.
   NEAC members and Presenters from Connecticut Academy of Science and Engineering (CASE) introduced themselves.

2. **PROGRAM:**

   a) **Briefing by Connecticut Academy of Science and Engineering (CASE) on The Future of Nuclear Power in Connecticut**
   CASE presenters presented a series of power point presentations that had originally been presented to the Connecticut Energy Advisory Board in December 2011. Copy of the presentations are attached to the minutes.
   During and following the presentation, members of NEAC asked questions and provided comments to the presenters. There was a lively discussion regarding the future of commercial nuclear power plants in Connecticut.

3. **Public Comment**
   One member of the public commented and asked a few questions of the CASE presenters.
   There was a discussion among NEAC members whether to endorse any of the recommendations of the CASE study. It was decided that any endorsements would occur at the next meeting of NEAC.

4. **Approval of Minutes of December 8, 2011 NEAC meeting**
   Minutes were approved without any corrections

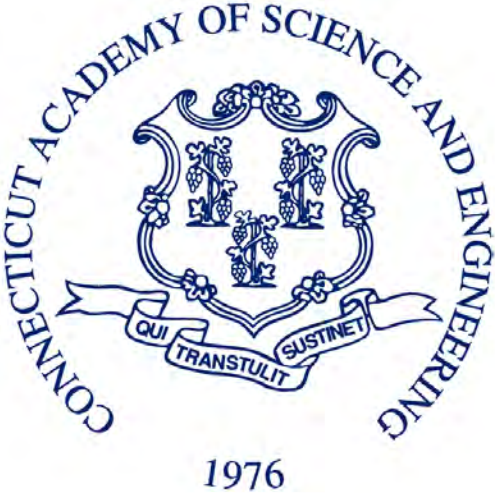
5. **NRC Correspondence Received since past meeting.**
   The list of NRC Correspondence was reviewed. There were no questions from NEAC members.

6. **Next Meeting Date and Time**
   The next NEAC meeting will be the joint meeting with the NRC and will occur on date and time as requested by the NRC

7. **Adjournment**
   Motion was made by Mr. Hicks and seconded by Mr. Klancko to adjourn; no objections; unanimous vote in favor; meeting adjourned at 8:33 PM.

## NRC Correspondence Received Since Last NEAC Meeting

1. Millstone Power Station Units 2 & 3 Request for Additional Information Regarding 60 Day Response to Bulletin 2011-01,"Mitigating Strategies" dtd December 8, 2011
2. Millstone Power Station-NRC Security Baseline Inspection Report dtd December 22, 2011
3. Millstone Power Station Units 2 & 3- Audit of the Licensee's Management of Regulatory Commitments dtd December 28, 2011
4. Millstone Power Station Unit 2-Request for Additional Information Regarding Request for Exemption From Title 10 of the Code of Federal Regulations Part 50, Appendix R, Section III.G. "Fire Protection of Safe Shutdown Capability" dtd January 13, 2012
5. Millstone Power Station NRC Integrated Inspection Report for Last Quarter CY2011 dtd January 23, 2012
6. Millstone Power Station Units 2 & 3 – Branch Chief Reassignment in the Office of Nuclear Reactor Regulation dtd January 23, 2012
7. Announcement of Pre-Application Meeting with DNC, Inc. to Discuss a Proposed MPS2 License Amendment Request Concerning Spent Fuel Pool Criticality Reanalysis on Wednesday Feb 15, 2012 dtd February 1, 2012




# *Advances in Nuclear Power Technology*

**STUDY BRIEFING**

**December 9, 2011**

# Study Committee

- **Michael F. Ahern** Vice President, Utility Services, Northeast Utilities
- **Donald W. Downes**, Chairman, DPUC (ret.)
- **A. George Foyt, ScD** *(Academy Member)*, Manager of Electronics Research, United Technologies Research Center (ret.)
- **Gale Hoffnagle,** CCM, QEP *(Academy Member)* Senior Vice President and Technical Director, TRC Environmental Corporation
- **Hanchen Huang, PhD**, School of Engineering Named Professor in Sustainable Energy, Department of Mechanical Engineering , University of Connecticut
- **Charles L. Kling, PhD** *(Academy Member)*, Consulting Engineer, Westinghouse Electric Company, LLC
- **Lee S. Langston, PhD,** *Study Committee Chairman (Academy Member)*, Emeritus Professor of Mechanical Engineering, University of Connecticut
- **Ralph Lewis** *(Academy Member)*, Professor in Residence, Marine Sciences, Long Island Sound Center, UCONN-Avery Point , State Geologist, Department of Environmental Protection (ret.)
- **Harris Marcus, PhD** *(Academy Member)*, Director, Institute of Materials Science, University of Connecticut
- **Regis A. Matzie, PhD** *(Academy Member)*, Executive Consultant, Westinghouse Electric Company LLC
- **Kevin McCarthy**, CT Dept. of Environmental Protection (ret.)
- **Edward J. Mroczka**, Former Northeast Utilities Senior Vice President, Nuclear Engineering and Operations (ret.)
- **Fred L. Robson, PhD**, Principal Engineer, kraftWork Systems, Inc.
- **Sara Rockwell, PhD** *(Academy Member)*, Professor of Therapeutic Radiology and Pharmacology Associate Dean for Scientific Affairs, Yale School of Medicine
- **John (Jack) M. Tuohy Jr., PE**, Executive Director, Nuclear , Hitachi Power Systems America, Ltd.
- **Edward L. Wilds, Jr., PhD**, Director, Division of Radiation, Bureau of Air Management, Department of Environmental Protection

# Study Management Team

## ***Study Management Team***

**David Pines, PhD,** Associate Professor and Chair of Civil, Environmental, and Biomedical Engineering, University of Hartford

**Tom Filburn, PhD,** Professor of Mechanical and Biomedical Engineering, University of Hartford

## CASE Staff

**Richard Strauss**, Executive Director
**Terri Clark,** Associate Director
**Ann Bertini,** Assistant Director for Programs

# Academy Member Reviewers

- **Peter Cable, PhD, Applied Physical Sciences Corporation**
- **John Cagnetta, PhD, Northeast Utilities (ret.)**
- **Sten Caspersson, Westinghouse Electric Company**

# Study Background

- **CEAB requested that CASE perform a study on advances in nuclear power technologies to inform and assist the state's leadership in making decisions that are in the best interest of Connecticut citizens with regard to the use of nuclear power in the 21st century and beyond**
- **Study Scope based on work items identified by the CEAB including items in the CEAB 2010 Integrated Resource Plan (IRP) - Nuclear Power Section:**
  - **Current Status of Nuclear Energy in Connecticut**
  - **Fuel Security**
  - **Safety Concerns**
  - **Environmental Issues**
  - **Nuclear Proliferation**
  - **Financing & Schedule Risks of Planning & Constructing a Nuclear Plant**

# Study Background *(Continued)*

- **Two sub-studies were conducted as part of the larger study**
  - **Detailed *Economic Impact Analysis* by the Department of Economic & Community Development with support from CERC. Provided an assessment of the economic and fiscal impacts of replacing or adding baseload generation in Connecticut**
    - **Replacing existing nuclear unit(s) at Millstone with a 1,000 MWe nuclear or CCGT plant**
    - **Adding a 1,000 MWe nuclear or CCGT plant at Millstone or CT Yankee sites**
  - ***Benchmark Survey* by the Connecticut Economic Resource Center (CERC) of 600 Connecticut residents on their attitudes about nuclear power**

# Video Recordings of Presentations

- The Uncertain Future of Nuclear energy after Fukushima: Professor Frank von Hippel; May 10, 2011
- About mPower Reactor Technologies: Jeff Halfinger, Babcock and Wilcox Company; February 4, 2011
- An Industry Perspective on Closing the Nuclear Fuel Cycle: Mr. Paul Murray, AREVA; February 4, 2011
- Nuclear Power in the United States: Dr. Pete Lyons, Acting Assistant Secretary for Nuclear Energy, U.S. Department of Energy; January 18, 2011
- Advances in Nuclear Power Technologies Study Committee Meeting: October 18, 2010
  - *Dry Spent Fuel Storage:* Bernie White, Technical Assistant, Division of Spent Fuel Storage and Transportation, Office of Nuclear Material Safety and Safeguards, Nuclear Regulatory Commission
  - *New Reactors: NRC Plans, Process & Progress*: Joe Colaccino, Chief, EPR Projects Branch, Office of New Reactors, Nuclear Regulatory Commission
  - *Atlantic Compact Commission: Update on Activities from 2000 through 2010*: Max Batavia, Executive Director, The Atlantic Interstate Low-Level Radioactive Waste Compact
  - *Low Level Radioactive Waste Disposal:* Kevin McCarthy (*Study Committee Member)* Atlantic Compact Commissioner for Connecticut

Video Recordings Provided by: Office of Research and Materials, Connecticut Department of Transportation

*Recordings will remain accessible on ConnDOT Website as part of the official record of this study*

# Briefing Agenda

- Overview of Nuclear Power
- Advances in Nuclear Power Technology
- Economic Impact Analysis
- Survey Results
- Findings and Recommendations

# Primary Conclusion

- **Nuclear power currently provides approximately 50% of Connecticut's electricity and has been the primary source of emission-free electricity generation since 1970**
- **Operating licenses of the two existing nuclear power plant units in Connecticut—Millstone Unit 2 and Unit 3—have been extended to 2035 and 2045, respectively**
- **Many years of planning and approvals would be required for their replacements**

# Primary Conclusion *(continued)*

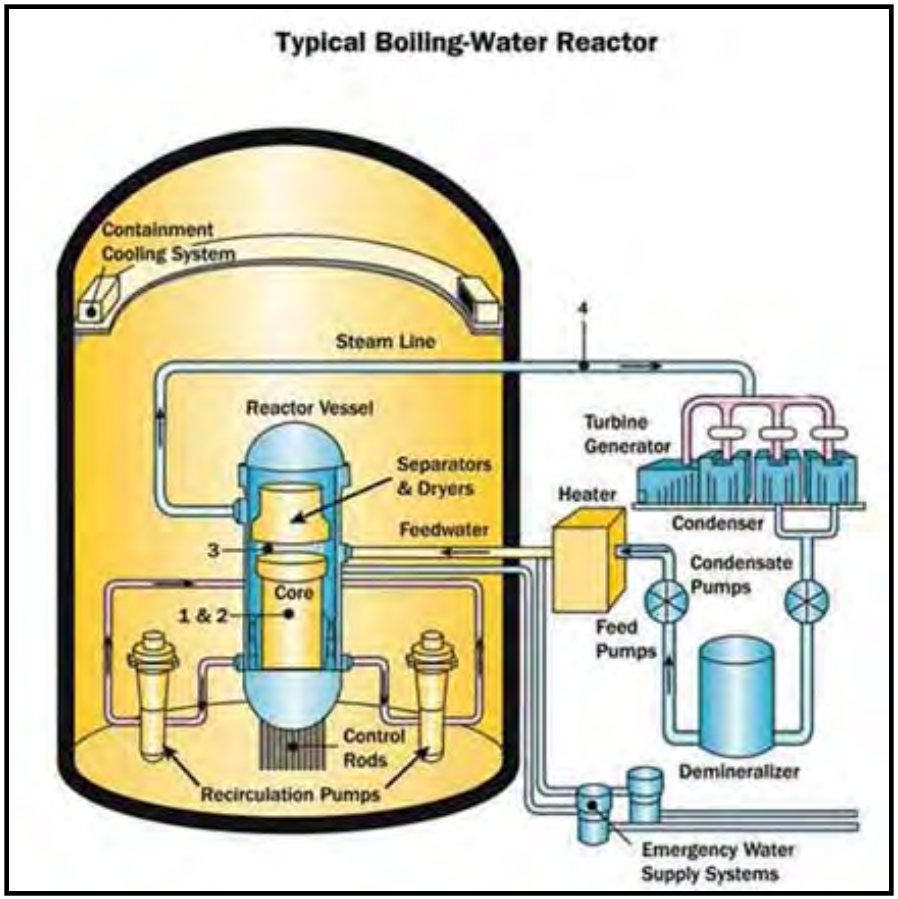
- **Benefits of new or replacement nuclear power generating units in Connecticut are:**
  - **Lower-cost baseload generation by replacing marginal cost electricity generators**
  - **Emission-free electricity generation**
  - **Fuel diversity in the ISO-New England Region**
  - **Creation of new jobs by expanding the highly trained workforce required to safely operate nuclear power plant units**

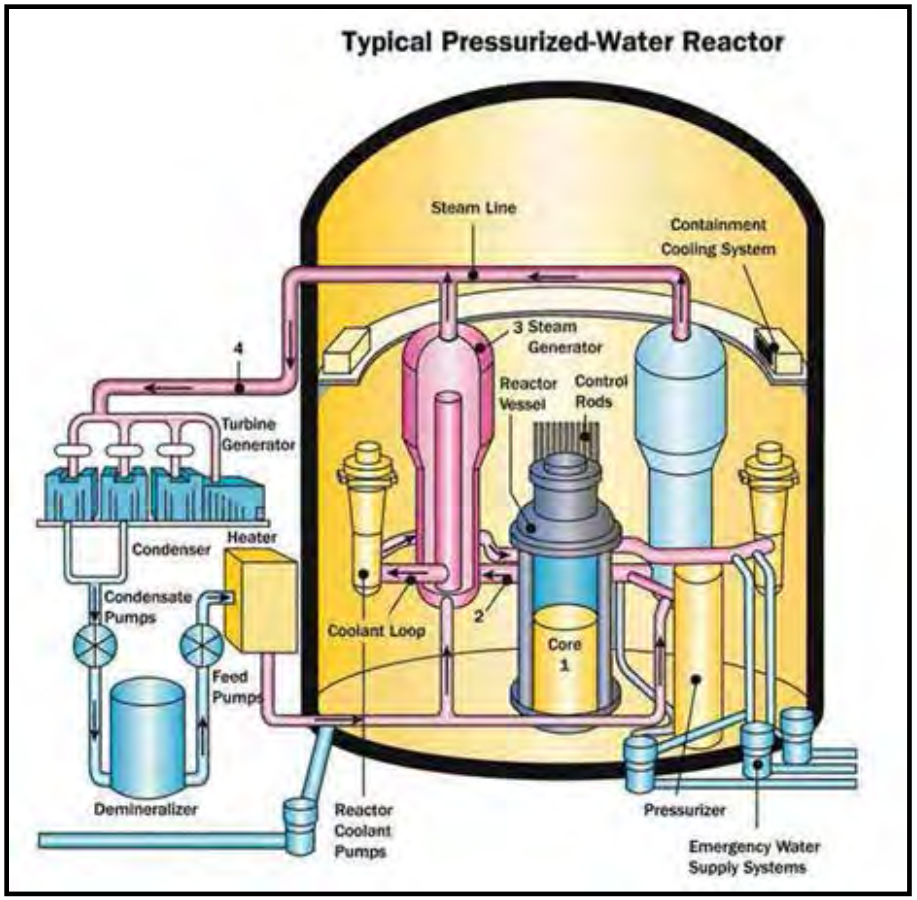
# Primary Conclusion *(continued)*

## To achieve these benefits

- **Nuclear industry must successfully demonstrate that:**
  - **Nuclear power plants can be constructed and delivered on budget and on schedule using advanced construction and modular manufacturing techniques**
  - **New and current nuclear plants can be operated at a high level of safety and security**
- **State's leadership needs to:**
  - **Aggressively demand that the federal government meet its legal obligations regarding spent nuclear fuel by expeditiously providing storage, geological disposal, and funding of nuclear waste management**

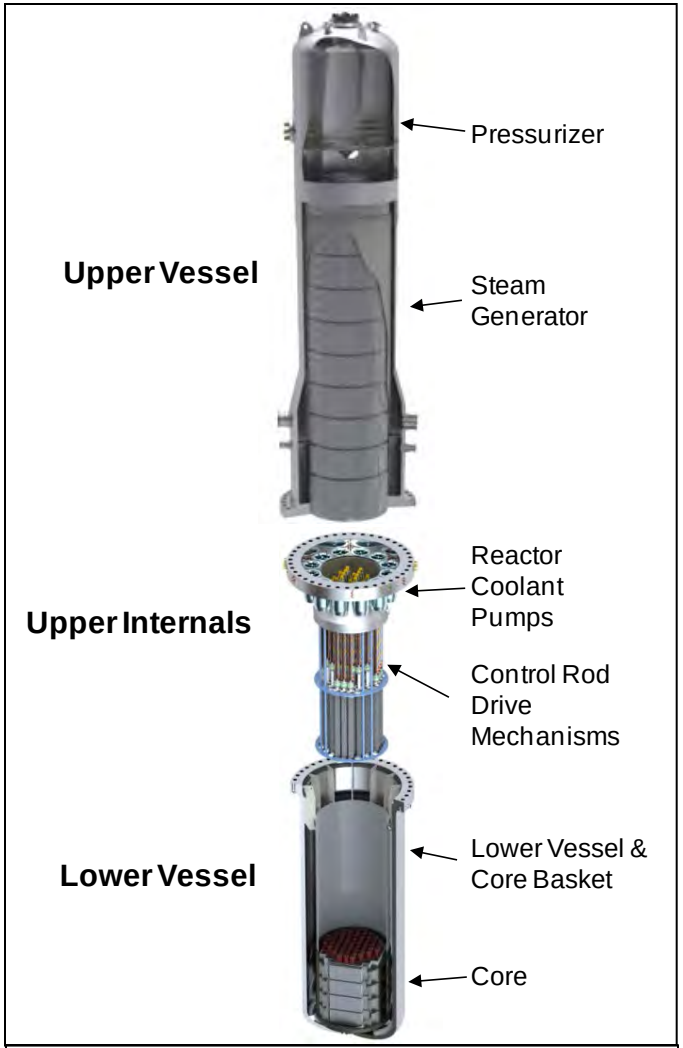
# Overview of Nuclear Power



# Types of Reactors Operating, Being Built, or Under Development

- **Light Water Reactors (operating) Generation II**
  - **Boiling Water Reactors**
  - **Pressurized Water Reactors**
- **Generation III and III+ Reactors (being built)**
  - **Active Safety Systems**
  - **Passive Safety Systems**
- **Small Modular Reactors (under development)**
- **Generation IV Reactors (potentially ready >2030)**

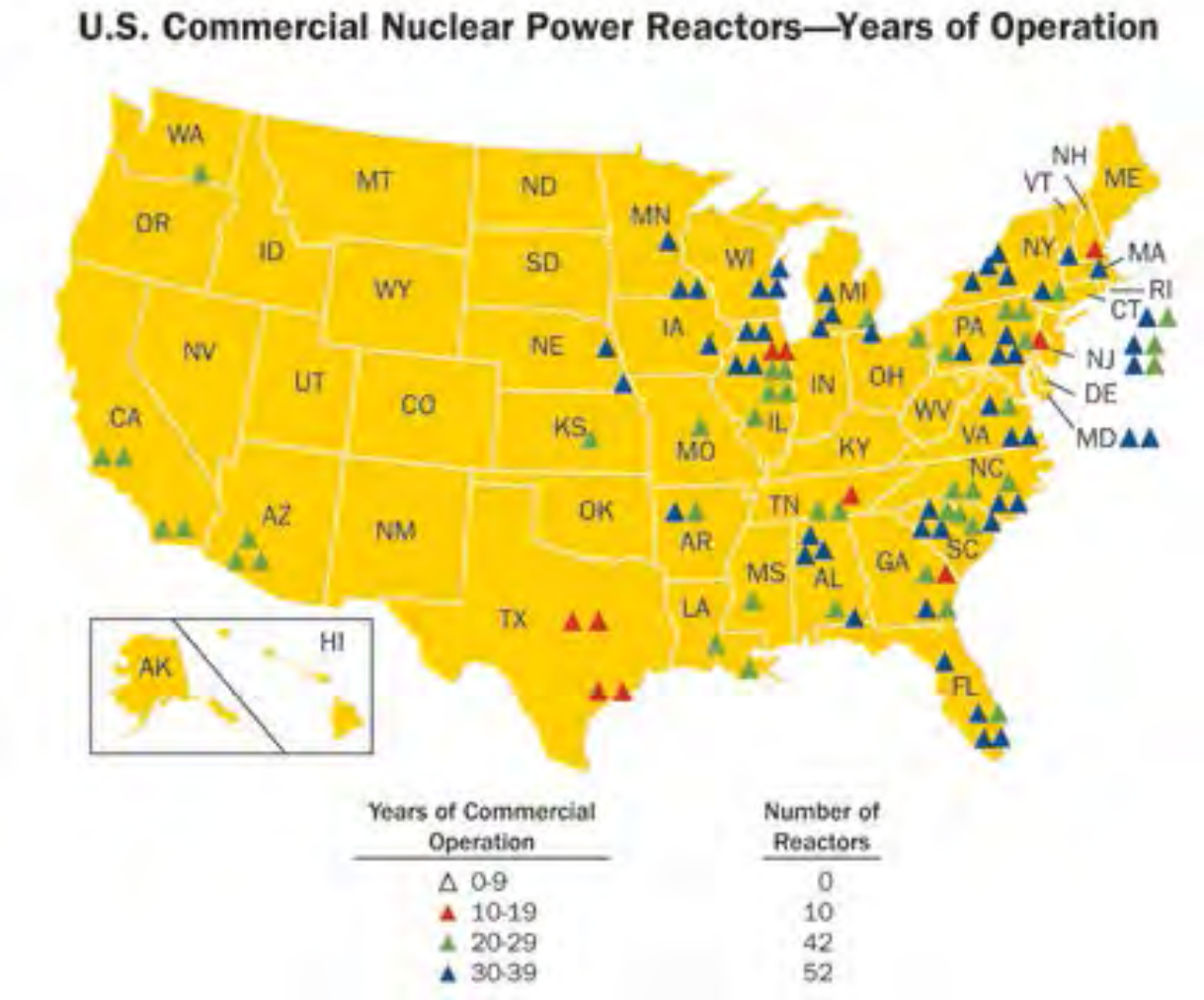



**Source: Babcock and Wilcox mPower SMR**

# World Status of Nuclear Power Plants

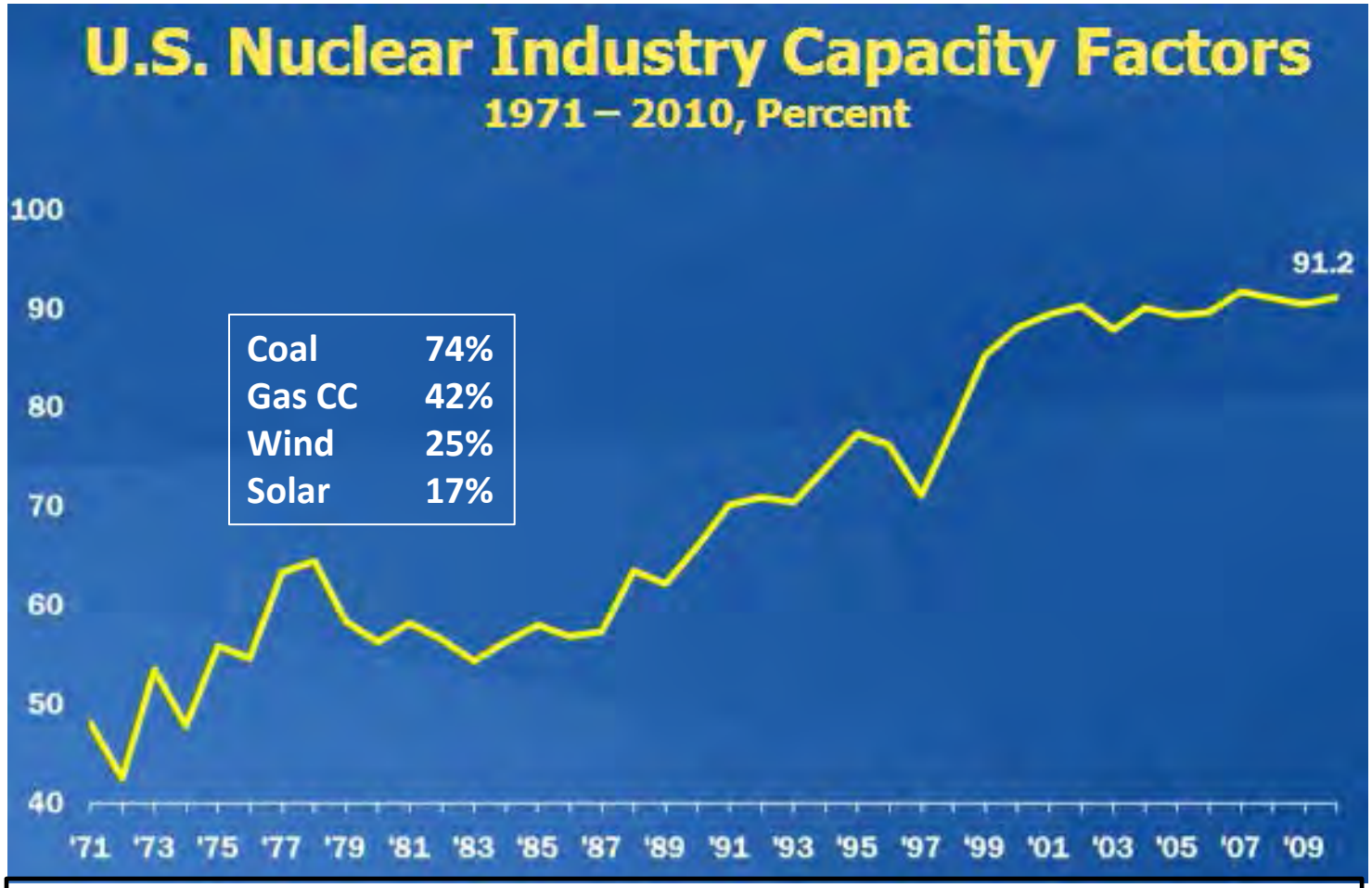
- **443 nuclear reactors operating worldwide in 29 countries *(~16% of electricity generated)*** **** Note: stats prior to Fukushima incident*
- **104 nuclear reactors operating in U.S. in 31 states (19.6% of electricity generated)**
- **64 new nuclear reactors under construction in 15 countries**
- **5 new nuclear reactors under construction in U.S.**
  - **Watts Bar 2 (TVA)**
  - **Vogtle 3&4 (Southern Nuclear)**
  - **V.C. Summer 2&3 (SCANA)**
- **U.S. lifetime extensions (20 years)**
  - **66 approved by US NRC**
  - **16 filed for approval**
  - **20 more expected to file**

# U.S. Power Reactors in Operation (104 mostly in Eastern States)



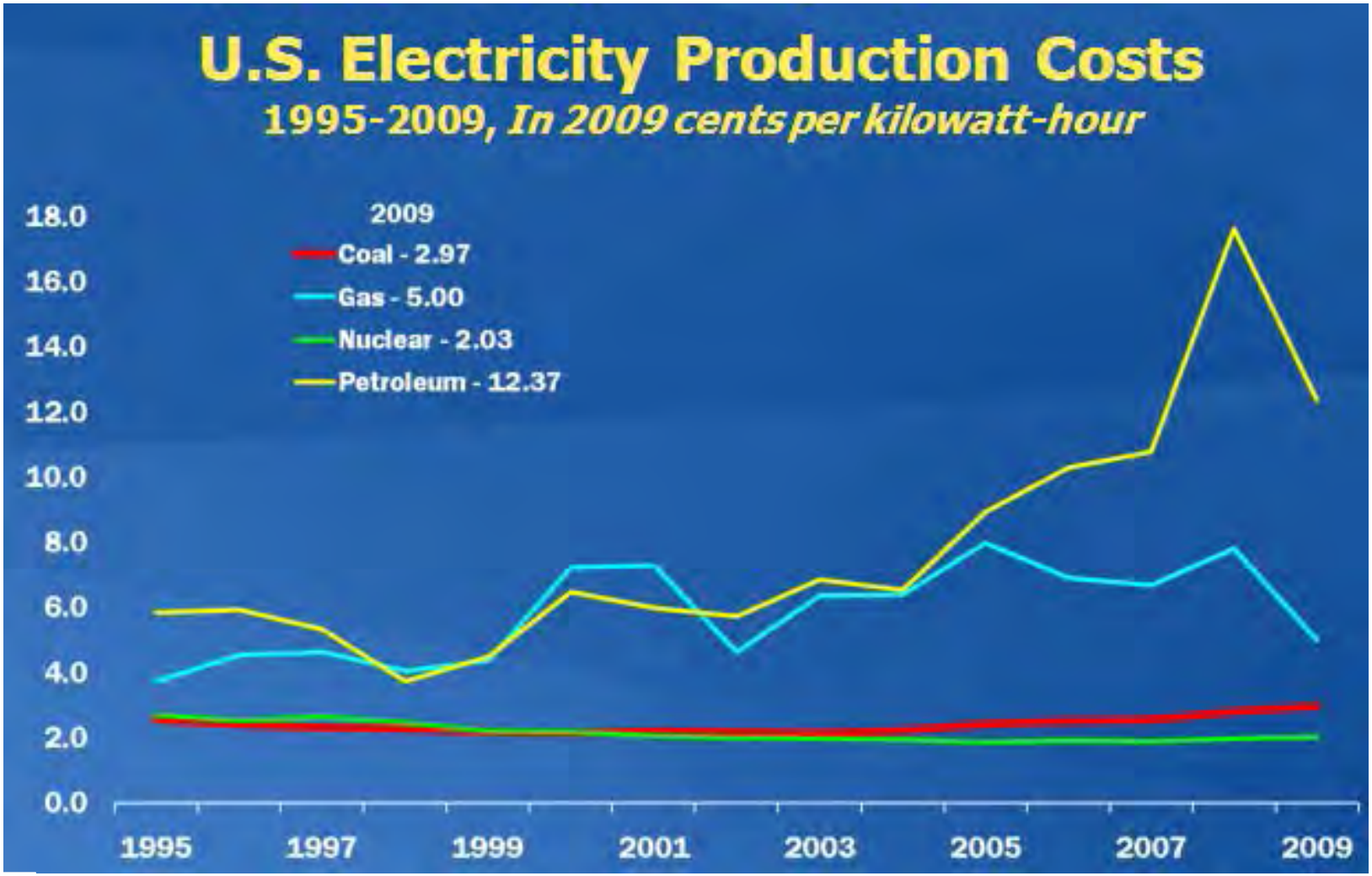

**Source: U.S. Nuclear Regulatory Commission (NRC)**

# U.S. Nuclear Industry Performance Improvement (Capacity Factors)



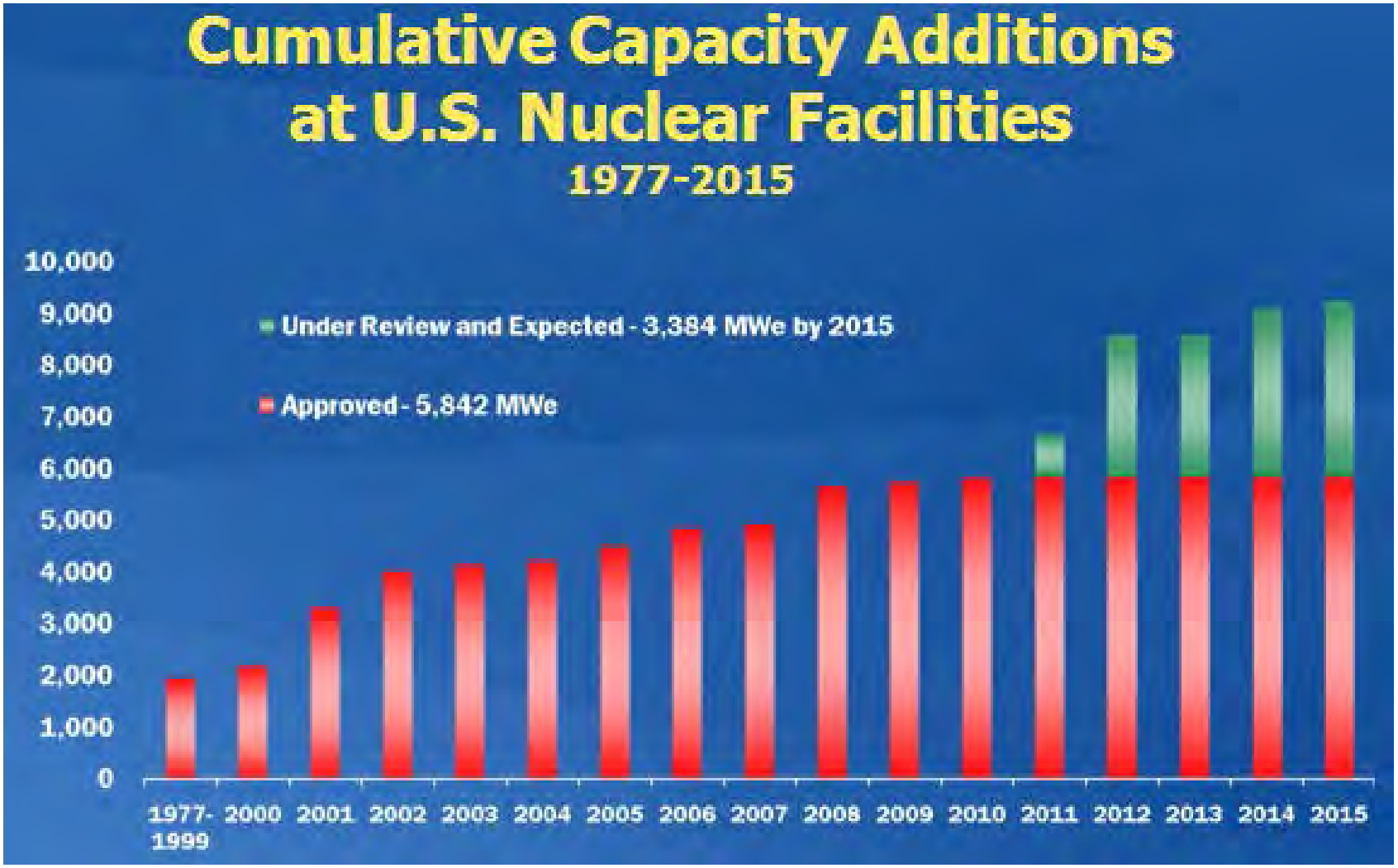

**Source: Energy Information Agency (EIA), U.S. DOE**
***EIA definition of Capacity Factor:*** *The ratio of the electrical energy produced by a generating unit for the period of time considered to the electrical energy that could have been produced at continuous full power operation during the same period*

# Comparison of Production Costs in U.S. by Fuel Type



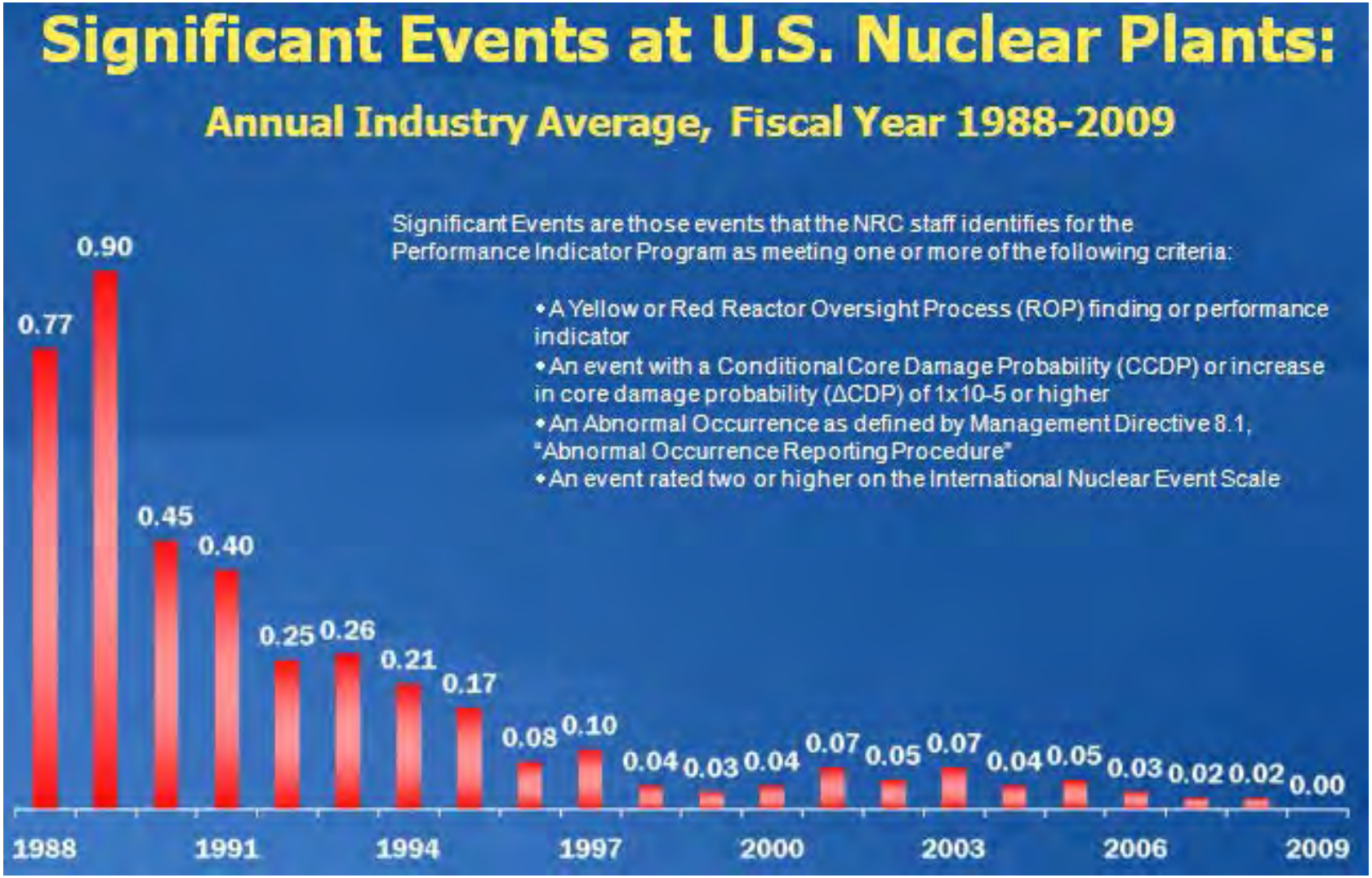

Source: Nuclear Energy Institute (NEI); Ventyx Velocity Suite, Update: 5/10

# U.S. Nuclear Capacity Additions by Power Upgrades



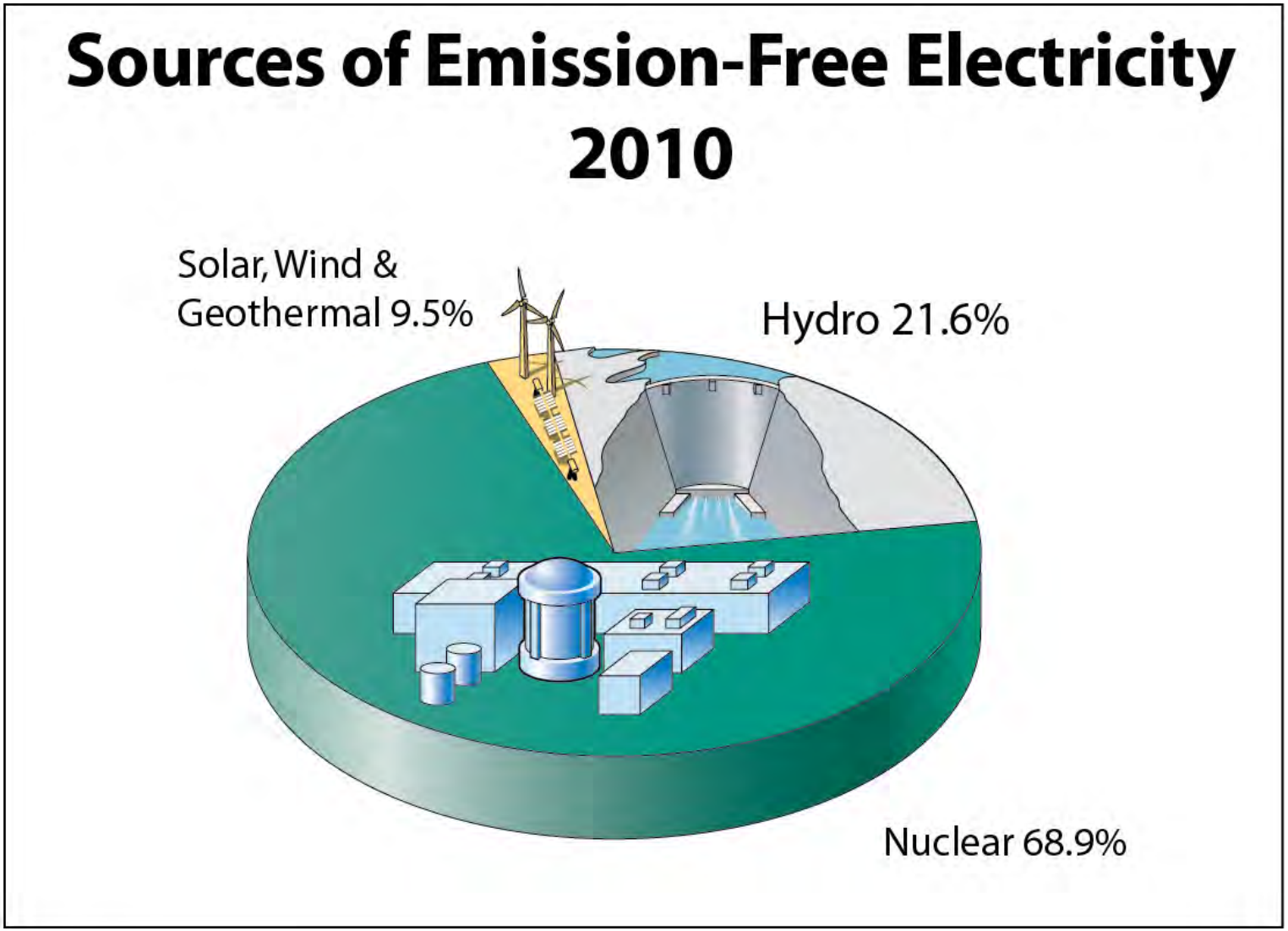

Source: NRC

# Significant Safety Events at U.S. Nuclear Plants




**Source: NRC Information Digest** ***(1988 is earliest year data is available)***

# Where U.S. Gets Emission Free Electricity Today




**Source: NEI**

# Equivalent Land Area to Produce Same Power

## Green Energy Footprints

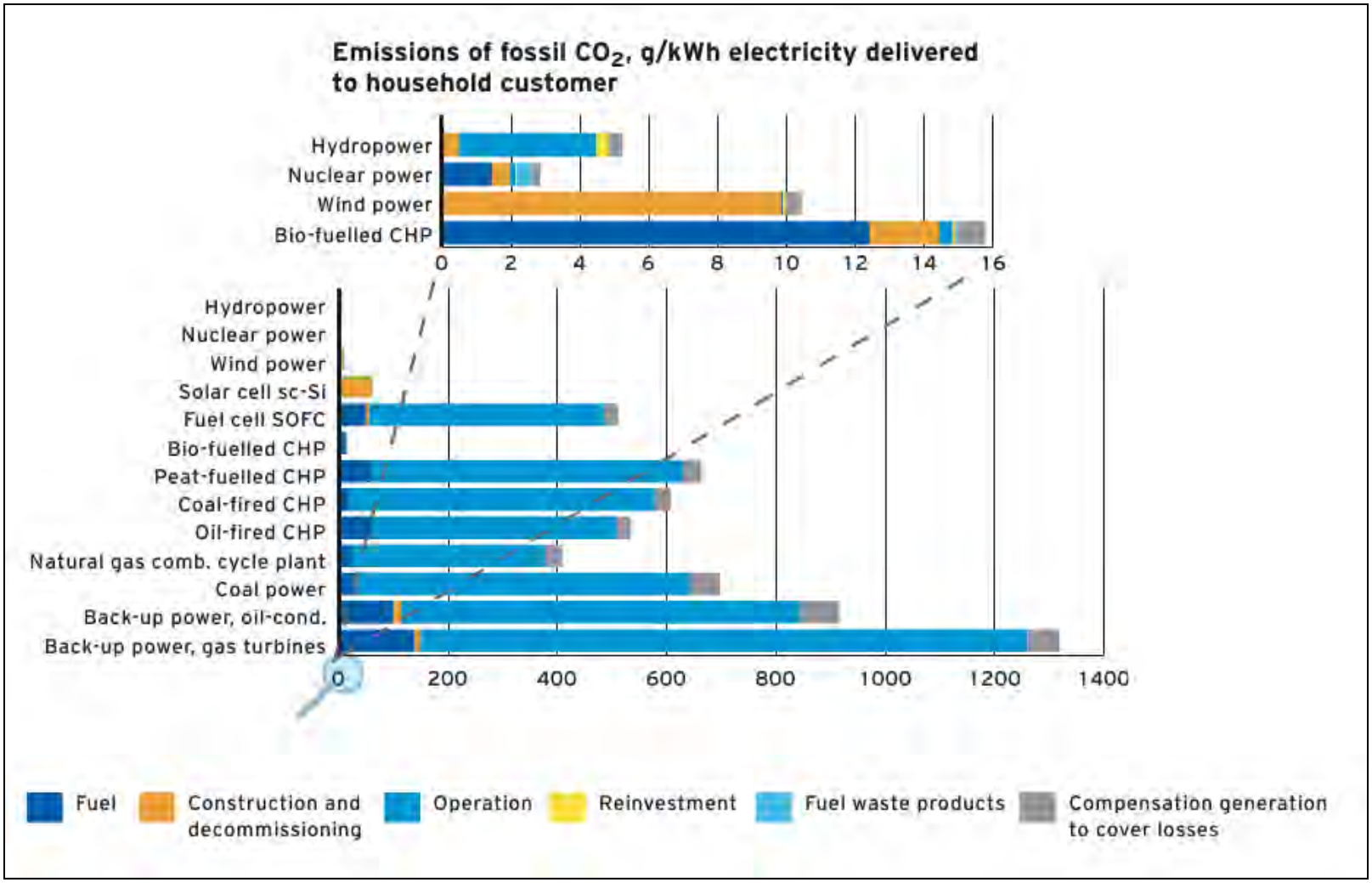
To produce 1000 MWe, you would need...


0.8 sq. miles


19 sq. miles


78 sq. miles

# $CO_2$ Emissions per kWh Electricity Delivered to Household Customer

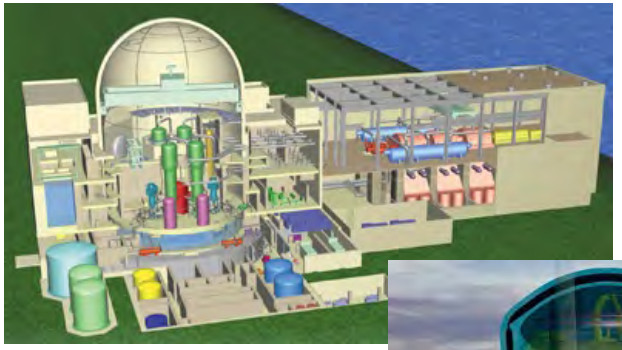



**Source: Vattenfall $CO_2$ Life-Cycle Analysis**

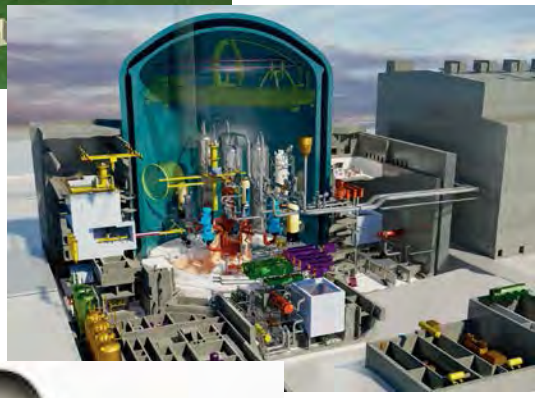
# Advances in Nuclear Power Technology

# New Reactor Designs with Active Safety Systems

- Rely on AC electrical power to power safety functions
- Utilize active pumps, valves, and support systems
  - Cooling water systems
  - HVAC systems
- Typically have 4 trains of mechanical safety systems
  - May have 2 or 4 trains of emergency electrical systems
- Core decay heat removal is provided by:
  - Steam Generators (via Emergency Feedwater System)
  - Residual Heat Removal System
  - Safety Injection System
  - Accumulators
- Containment heat removal is provided by Containment Spray System



APWR

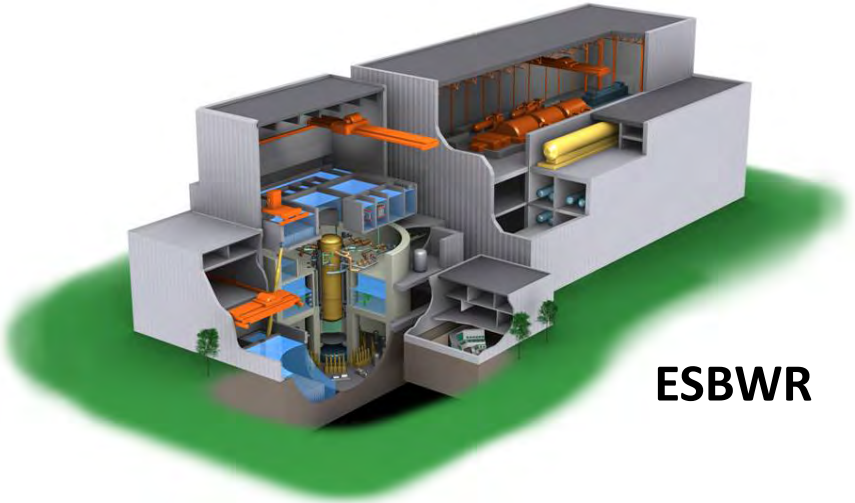


EPR

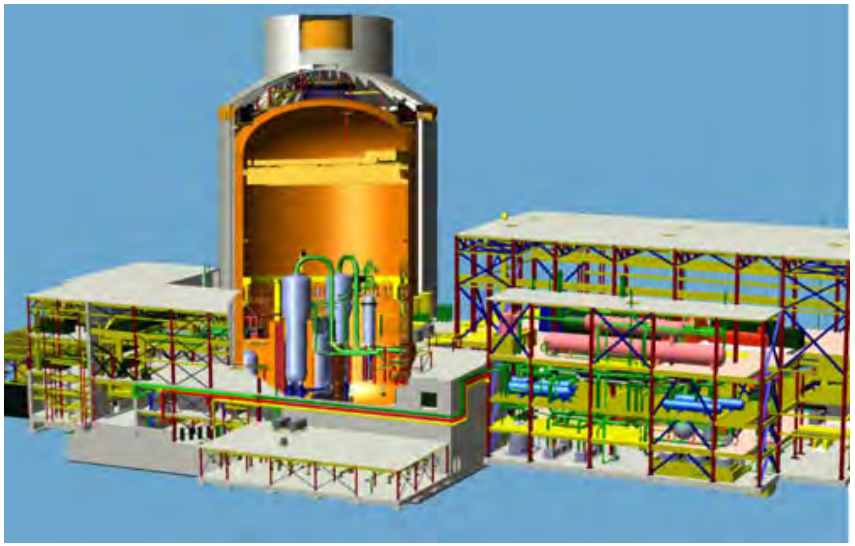
APR1400

# New Reactor Designs with Passive Safety Systems

- **Do not rely on AC electrical power to provide safety functions**
  - **Use natural forces of heat transfer, gravity, evaporation, etc.**
- **Use systems and water already inside the plant, e.g., inside containment, for core cooling and inventory control of reactor/fuel**
- **Containment heat removal by gravity feed, evaporation and/or air cooling**
- **Maintains safety functions for at least 72 hours without any operator actions**

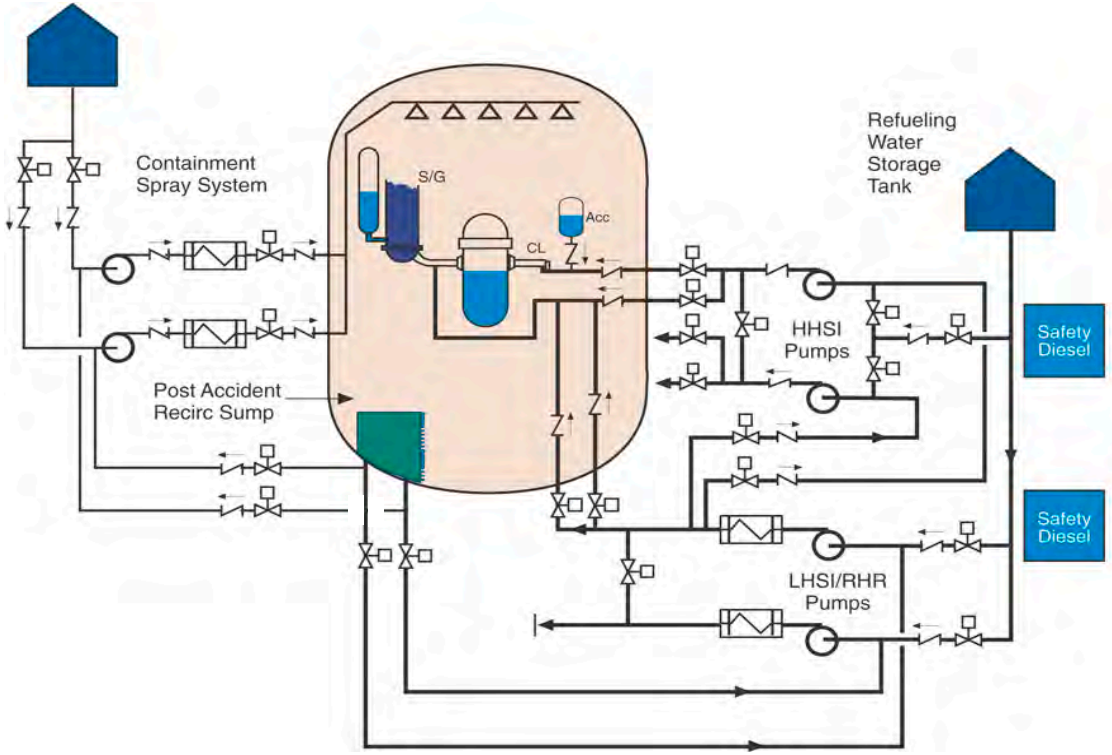


**ESBWR**

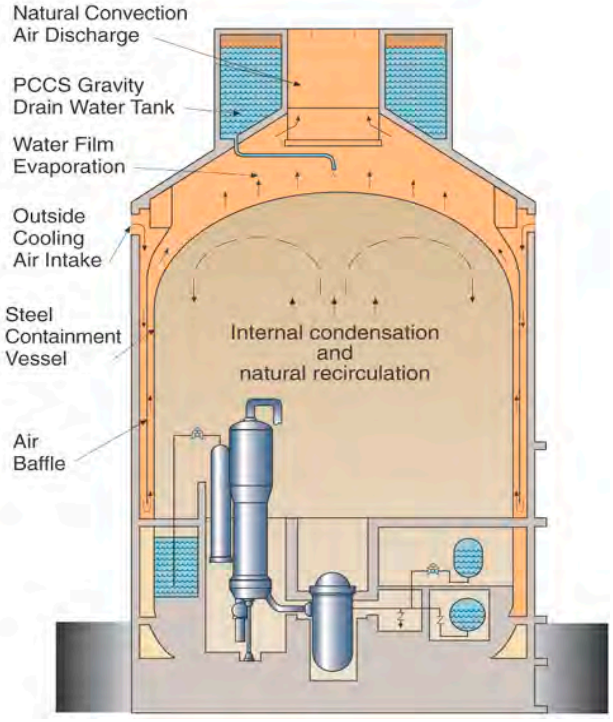


**AP1000**

# Comparison of Active & Passive PWR Safety Systems



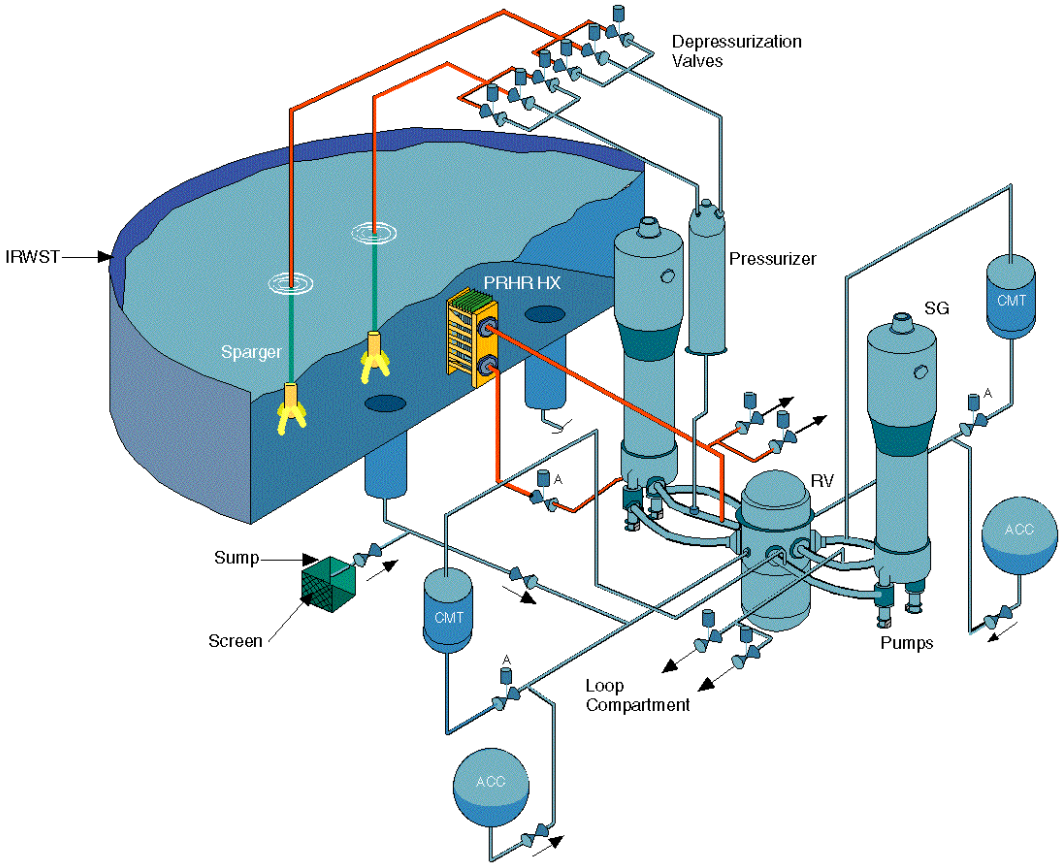

**Standard PWR**
**(only 2 trains shown)**




**AP1000**

# Passive Safety – How it Works

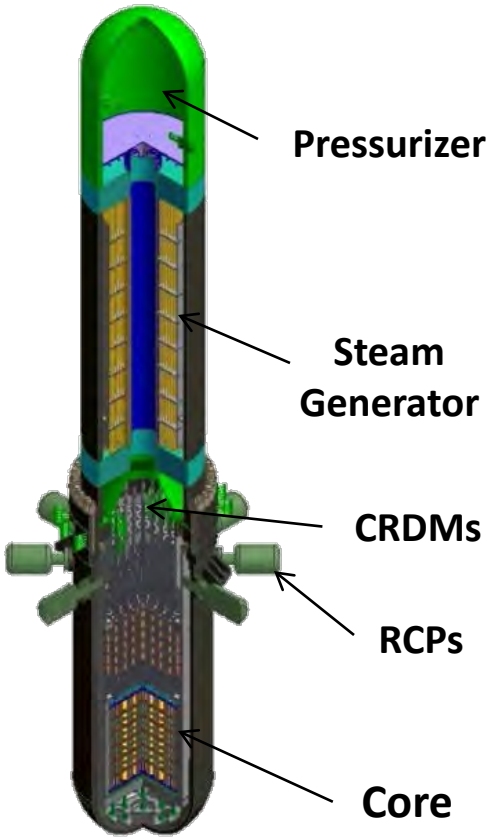
- All water is already inside containment
- Motive forces are gravity, compressed air, DC batteries, & convective heat transfer
- Automatically actuates without the need of operator action
- Simple alignment of a few valves which fail in a safe position




**AP1000 Reactor**
**Core Cooling & Inventory Makeup**

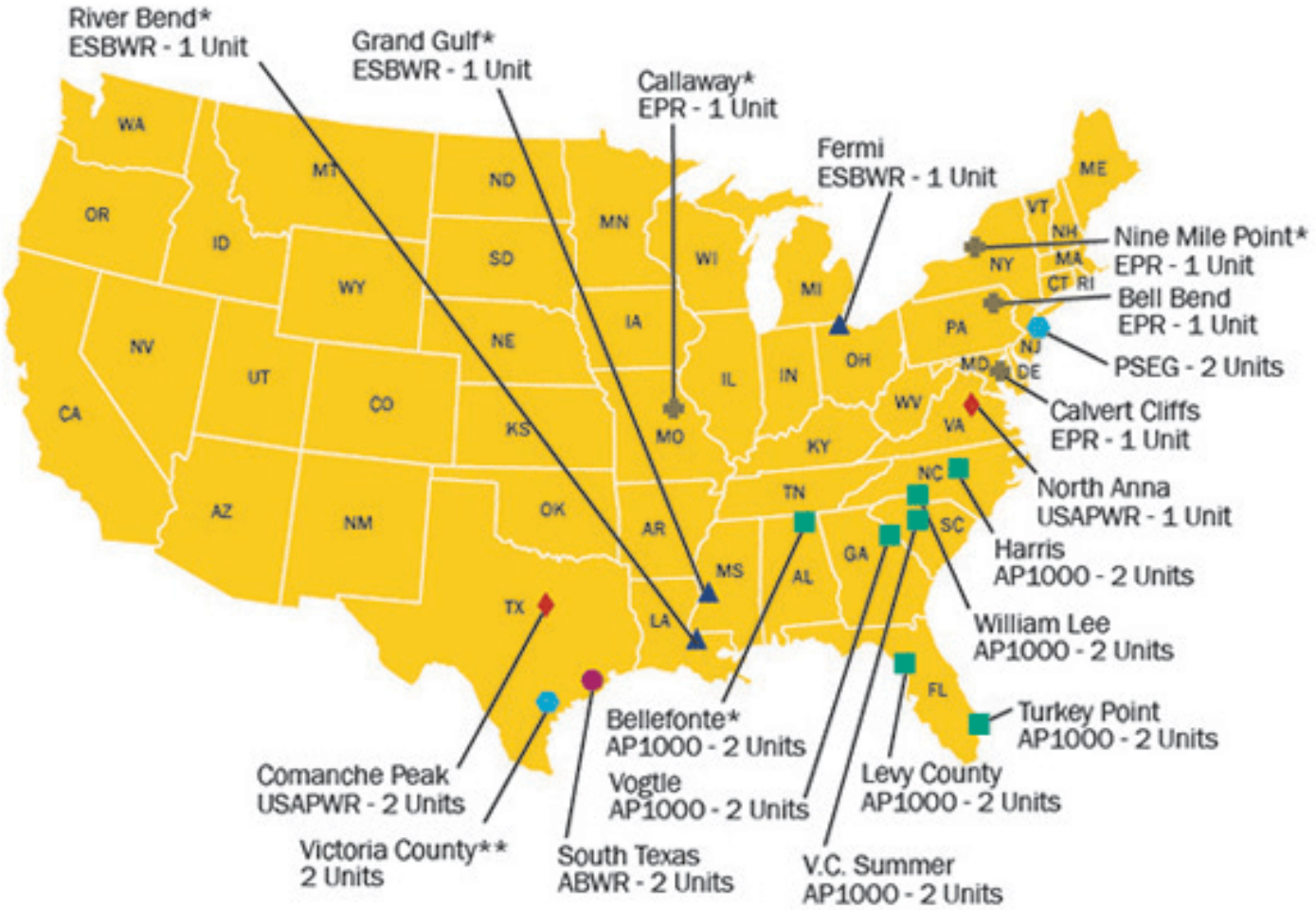
# Small Modular Reactors
## *Starting the Development Cycle*

- Must overcome the economies of scale
- Must be water cooled for mid-term deployment
- Must be highly standardized and factory built to control cost and achieve quality
- Must have short construction schedule
- Must be rail shippable to be broadly accessible
- Must use passive safety systems
- Must have certain prescriptive regulations revised
- Must have smaller Emergency Planning Zone to site near load centers



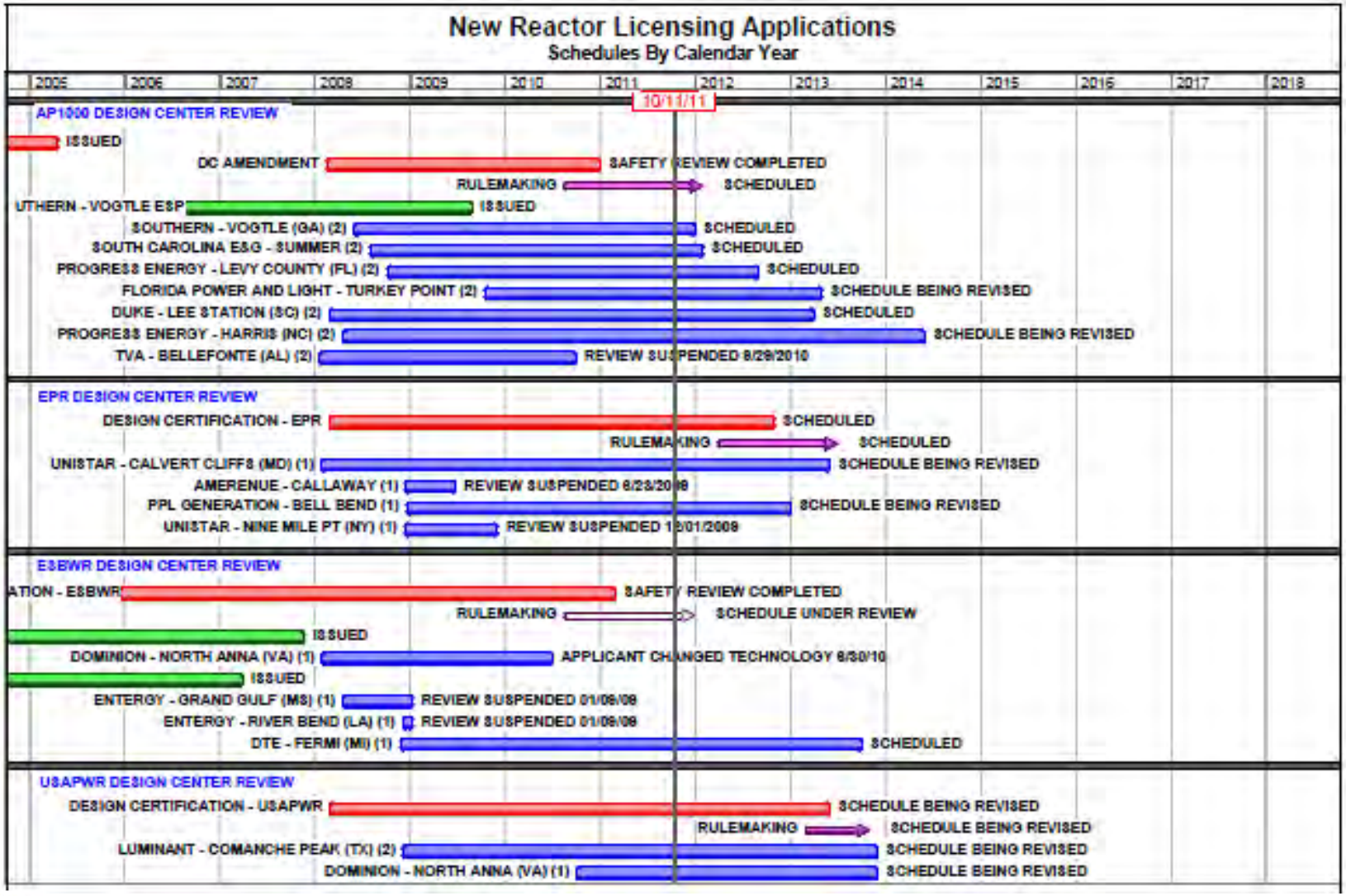

Typical SMR

# Locations of Proposed New Reactors in U.S.



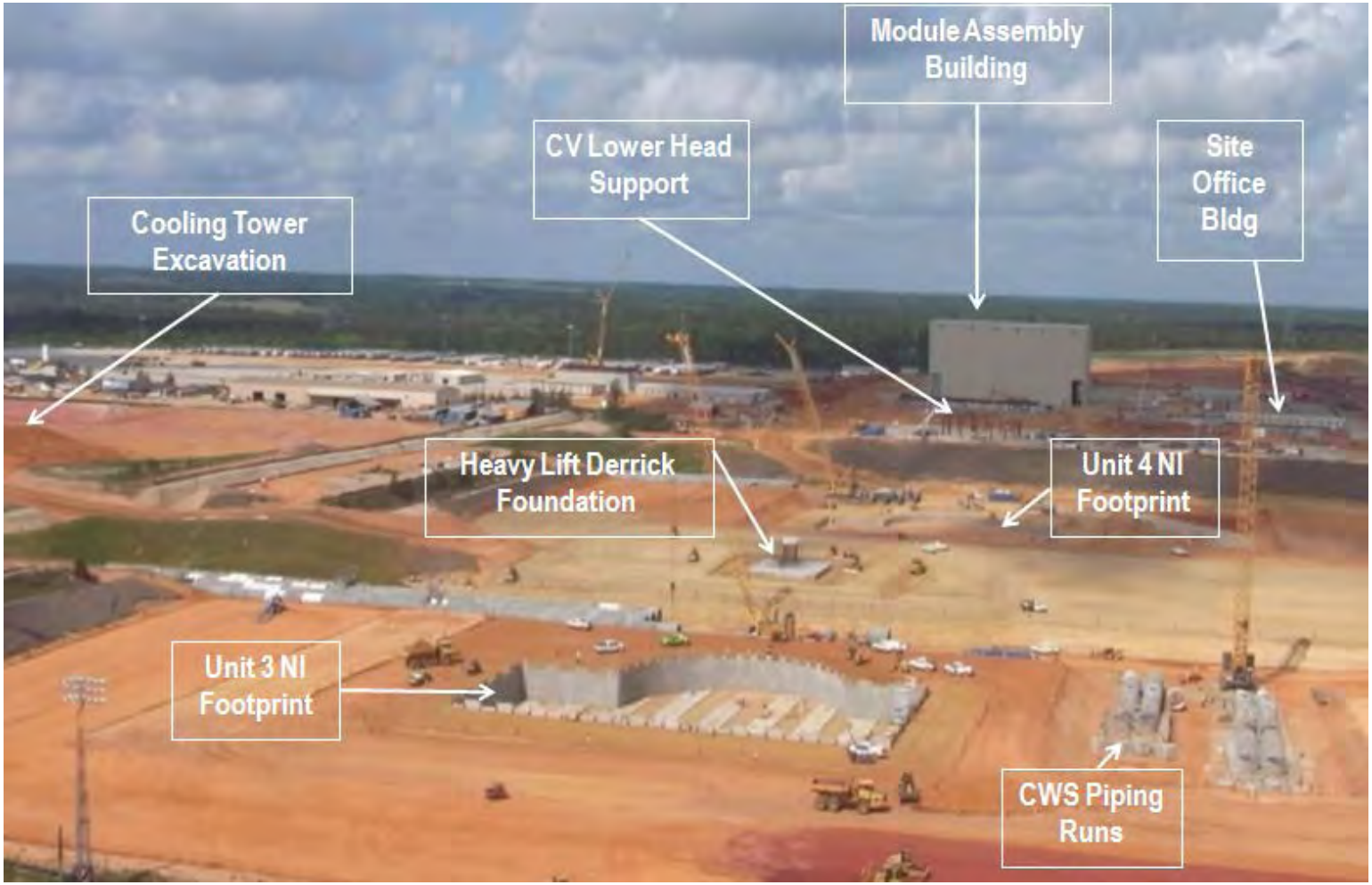

Source: NRC

# Status of New Plant Licensing




**Source: NRC: UPDATED 10/11/11**

# Construction Projects Today
## *(Example: Westinghouse AP1000)*



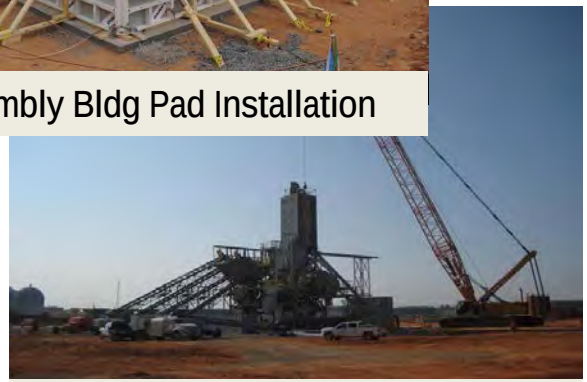

**Vogtle Units 3 & 4 (Georgia)**
**Early Stage Construction**

# Vogtle Project Status
## *Project is Meeting Schedule and is Under Budget*

- **Contract signed with Westinghouse team in April 2008**
- **Received Early Site Permit and Limited Work Authorization in August 2009**
- **Commenced Site Excavation in August 2009; completed Unit 3 in February 2010 and Unit 4 in April 2010**
- **Construction of Containment Vessel Assembly Building and Concrete Batch Plant Underway**
- **Nuclear component manufacture well underway**
- **NRC construction and operating license approval expected in January 2012**
- **Commercial Operations scheduled for 2016 and 2017**

Unit 4 Backfill Begins, Unit 3 Continues

Module Assembly Bldg Pad Installation



Concrete Batch Plant Erection

**Vogtle Units 3 & 4 located in Georgia near Augusta and Waynesboro**

# V.C. Summer Project Status

## *> 1 million project hours before 1st lost time accident*

- Contract signed with Westinghouse team in May 2008
- Installed over 400 sections of circulating water system piping
- Erected administration buildings, warehouses, & engineering/project support buildings
- Erected concrete batch plant #1
- Started excavation of power block area in March 2010
- Nuclear component manufacturing underway
- NRC construction and operating license approval expected in January 2012
- Commercial Operations scheduled for 2016 and 2018

Circulating Water System Piping

Electrical Ductbank

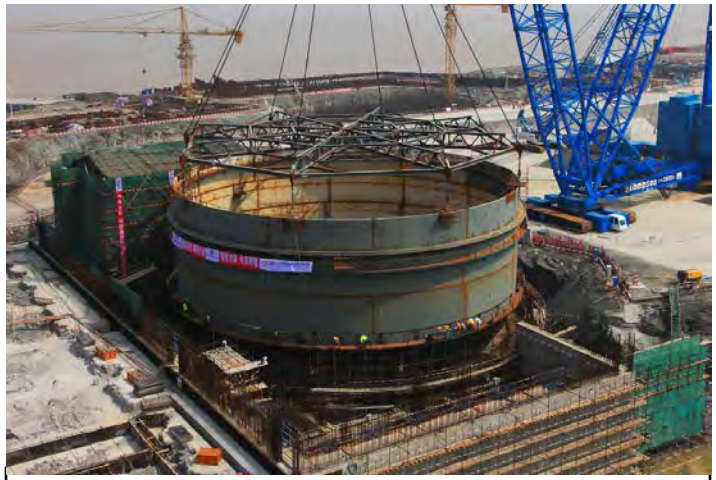
Module Assembly Building

**V.C. Summer plant located in Columbia, South Carolina**

# Construction Projects Today

***(Example: Westinghouse AP1000: 4 Units in Construction in China)***

# Sanmen Nuclear Power Station: Unit #1
## Sanmen County, Zhejiang Province, China



Containment Vessel Ring #1 (3/18/10)

CA01 Module Placement (3/27/10)

Reactor Vessel On Site (7/11)

Containment Vessel Ring #4 (12/10

# Sanmen Site – May 2011

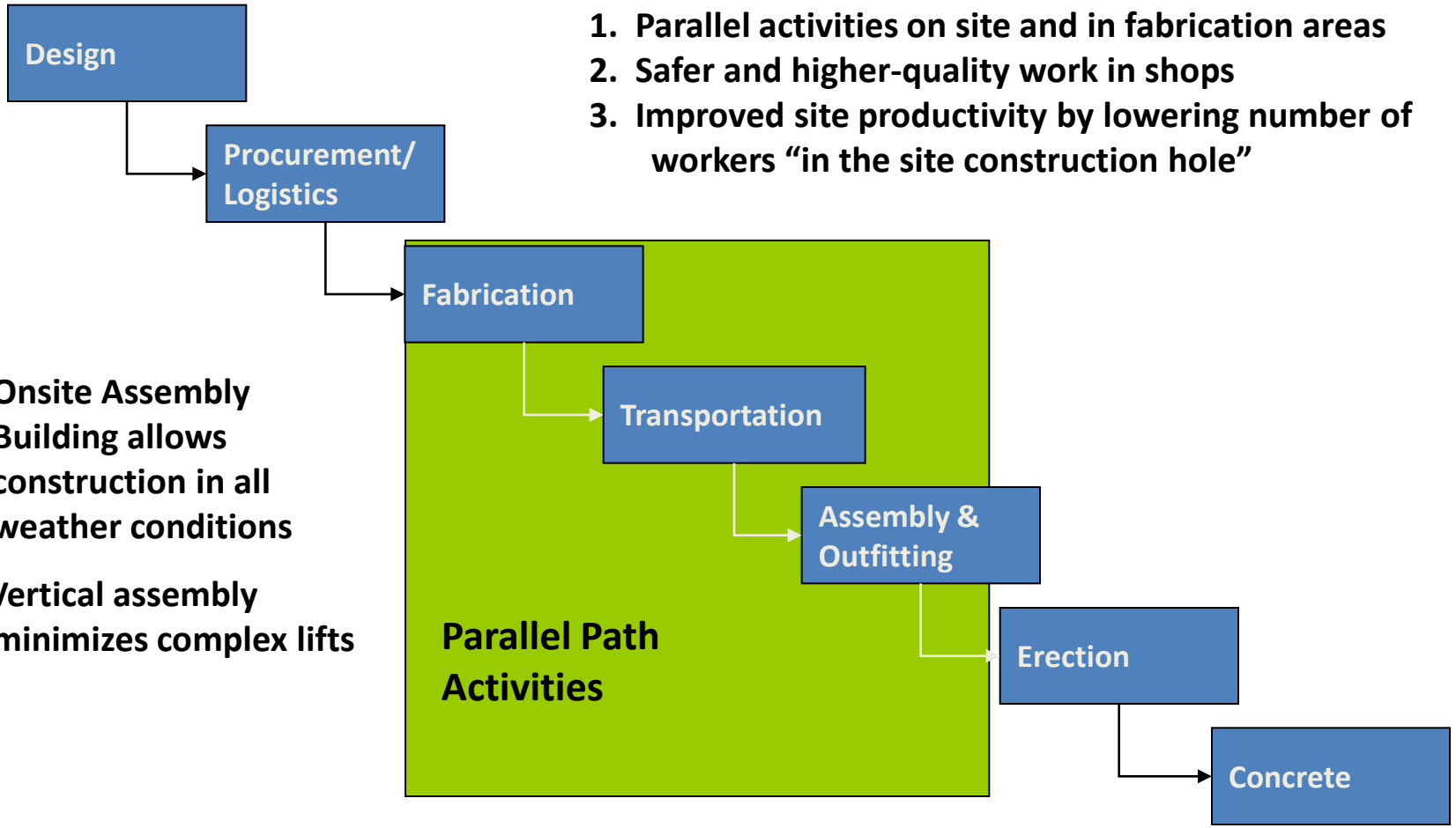
# What Is Different Today?

- Deployment of only standard plant designs
- Modern designs that utilize passive safety systems
- Designs that are complete before construction begins
- Incorporation of the lessons learned from past 3 decades
- Pre-licensed designs by NRC
- Government support for first movers (loan guarantees, standby support for regulatory delays not caused by the project, production tax credits because emission-free)
- Contracting structure where majority of risk is on suppliers
- Parallel module fabrication and site assembly/erection
- Modern construction techniques with advanced computer tools

# Module Manufacturing & Site Assembly

## Modular construction:

1. Parallel activities on site and in fabrication areas
2. Safer and higher-quality work in shops
3. Improved site productivity by lowering number of workers "in the site construction hole"

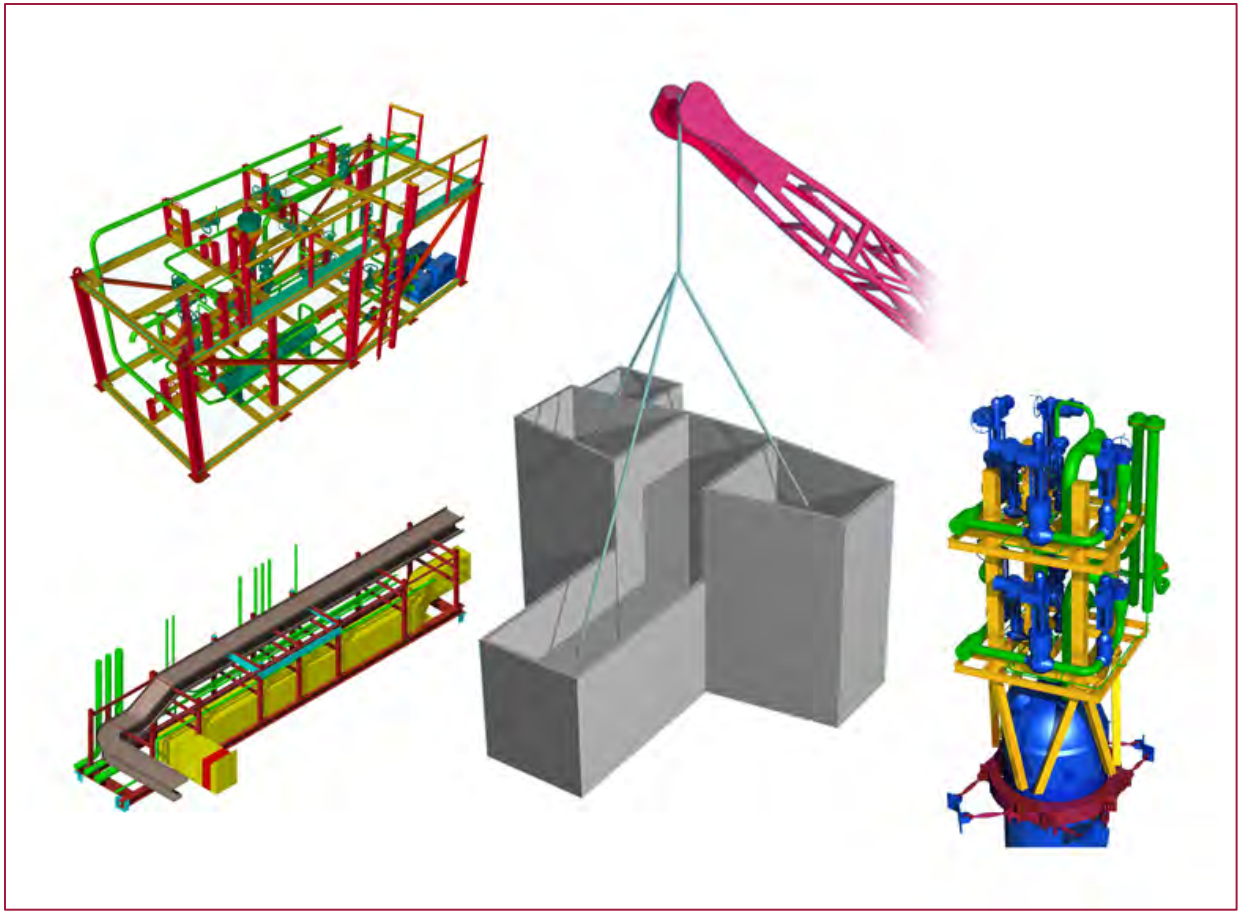



4. Onsite Assembly Building allows construction in all weather conditions
5. Vertical assembly minimizes complex lifts

# Example of Module Design & Construction

## *Westinghouse AP1000*

## *Generation III+ Nuclear Power Plant*

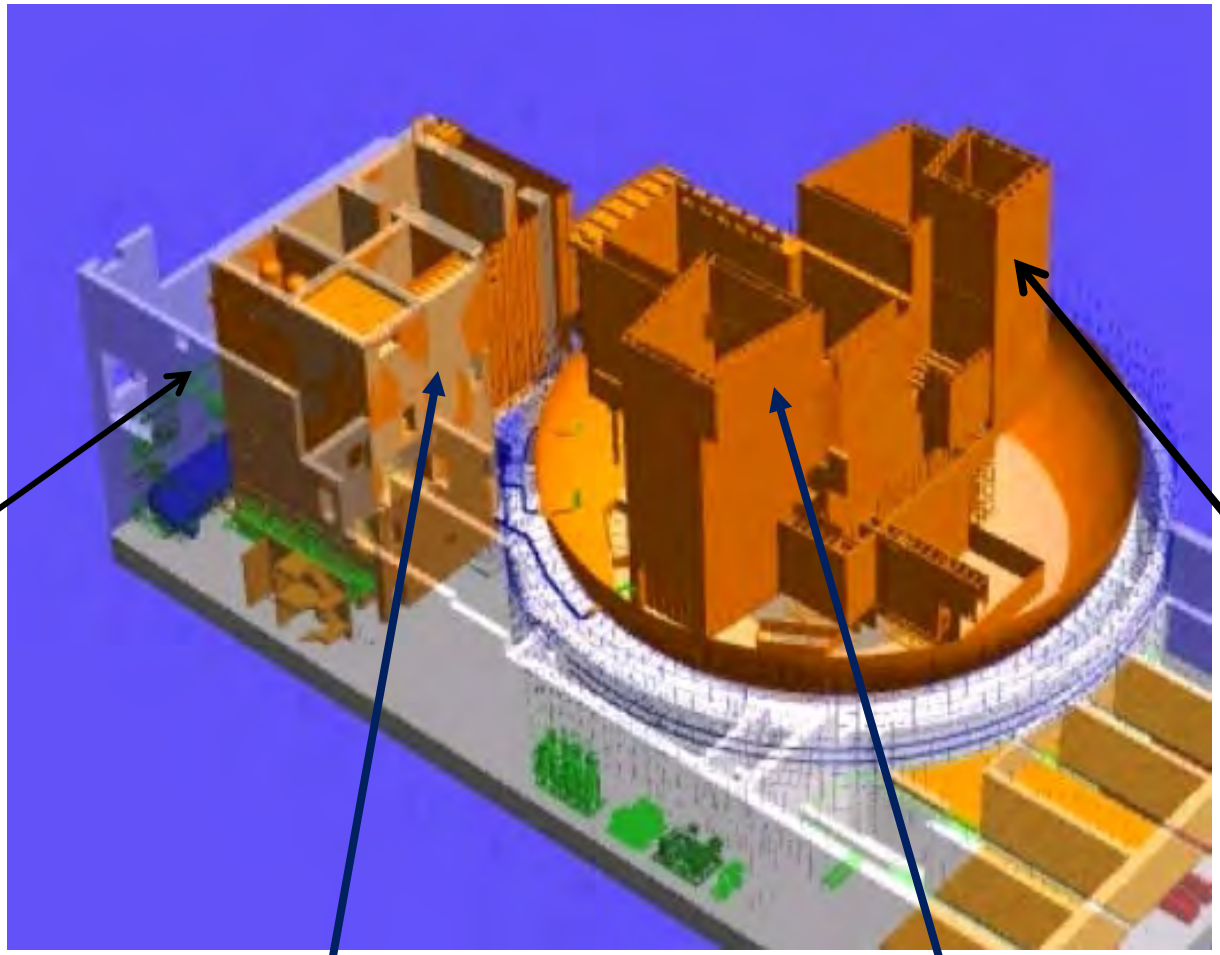


**Modules Designed into AP1000**

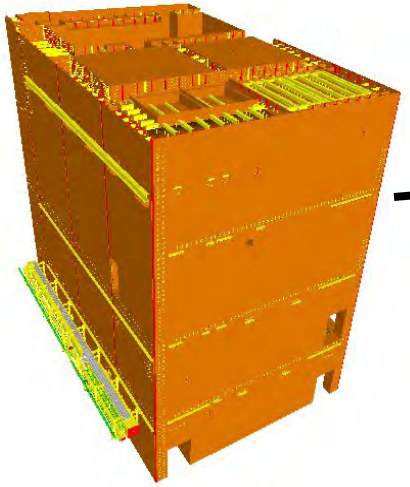
| Module Type | Number |
|---|---|
| Structural | 122 |
| Piping | 154 |
| Mechanical Equipment | 55 |
| Electrical Equipment | 11 |
| TOTAL | 342 |

# Large Structural Modules

## *Location in AP1000 Plant*



# CA20 Module Assembly
## *Auxiliary Building*



**Installation of CA20 Module**

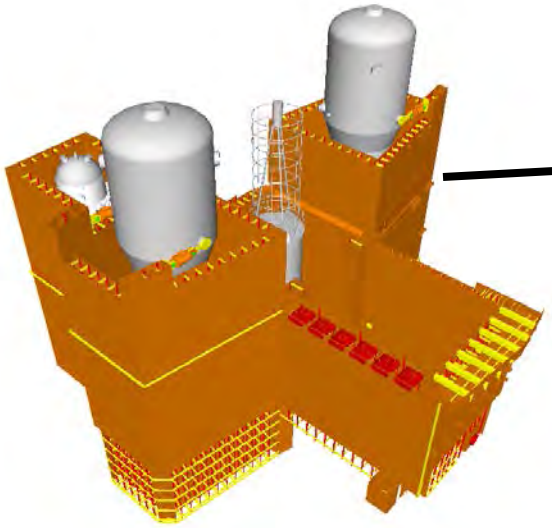
**CA20 comprised of 72 Sub-Modules:**

**Size (N x E x Height):**
**44'-0" x 68'-9" x68'-0"**

**Dry Weight:**
**1,700,454 lbs.**

**Classification:**
**Seismic Category I**

# CA01 Module Assembly
## Steam Generator and Refueling Canal Module



CA01 comprised of 47 Sub-Modules:

Size (N x E x Height):
92’-0” x 96’-0” x76’-0”

Dry Weight:
1,600,000 lbs. [725 Mg]

Installation of CA01 Module

# *The Great East Japan Earthquake*
# Fukushima Incident: *What Happened?*

**Fukushima Plant Before Earthquake/Tsunami**

# *The Great East Japan Earthquake*
# Fukushima Incident: *What Happened?*

**Fukushima Plant After Earthquake/Tsunami**

# *THE GREAT EAST JAPAN EARTHQUAKE* and Fukushima Incident: *What Happened?*

- ***GENERAL PERSPECTIVE ON SCOPE OF DAMAGE FROM EARTHQUAKE/TSUNAMI IN JAPAN – NOT RELATED TO FUKUSHIMA INCIDENT***
  - **~25,000 people died**
  - **200 square miles destroyed *(500,000 homes destroyed)***

- ***PERSPECTIVES ON FUKUSHIMA INCIDENT AS A RESULT OF THE EARTHQUAKE/TSUNAMI***
  - **Fukushima reactors are all BWRs *(BWRs not in use in Connecticut — Millstone reactors are PWRs)***
  - **9.0 magnitude earthquake followed by >14 m Tsunami *(~50 minutes later) – both beyond design basis for nuclear power plants***
  - **All reactors automatically shut down upon earthquake; all safety systems actuated properly**
  - **Tsunami "knocked out" all off-site and on-site AC power – disabling safety systems**
  - **DC batteries dissipated in ~8 hours**
  - **Reactor heated up and water pressure relieved to suppression pool, reducing inventory in core**
  - **Fuel cladding oxidized, lost integrity and generated $H_2$ by exothermic reaction with water**
  - **Hydrogen explosions in spent fuel area caused most of structural damage *(vent path from primary containment)***
  - **Radioactivity released through vents and breach of 1 unit's containment**
  - **Over 70,000 people evacuated from area rapidly**
  - **Land contamination in surrounding area**

# *THE GREAT EAST JAPAN EARTHQUAKE*
# Potential Implications of the Fukushima Incident

- Displacement of local residences for extended period within evacuation zone
- Loss of existing nuclear capacity in Japan, Germany, and maybe elsewhere
- Financial disaster to TEPCO (Japanese utility)
- Reduced number of new reactors in future plans, including Japan
- Vulnerability analyses – exceeding design bases throughout the nuclear industry
- Potential backfits to operating reactors, e.g., incremental seismic supports, seaside retaining walls, water tight doors, etc.
- Quicker transfer of spent fuel from on-site pools to dry storage
- Revised siting criteria for new plants
- Design enhancements to new plants to make them more robust, e.g., against loss of all AC power, flooding protection beyond design bases

Dry Cask Storage of 25 Years of Nuclear Waste

# The Economic Impact of Nuclear Power Generation in Connecticut


**By**
**Connecticut Department of Economic and Community Development**
**With the Connecticut Economic Resource Center**

**Stanley McMillen, Ph.D., Managing Economist**
**Department of Economic and Community Development**

**Nandika Prakash, Economist**
**Department of Economic and Community Development**

**Alissa DeJonge, Director of Research**
**The Connecticut Economic Resource Center, Inc.**

**Dale Shannon, Senior Economist**
**The Connecticut Economic Resource Center, Inc**

# Assessing Connecticut Residents' Opinions of Nuclear Power

## Phone Survey Results - December 2010

**By**
**Connecticut Economic Resource Center**
**Alissa DeJonge, Director of Research**

CERC
Solutions with Economic Impact

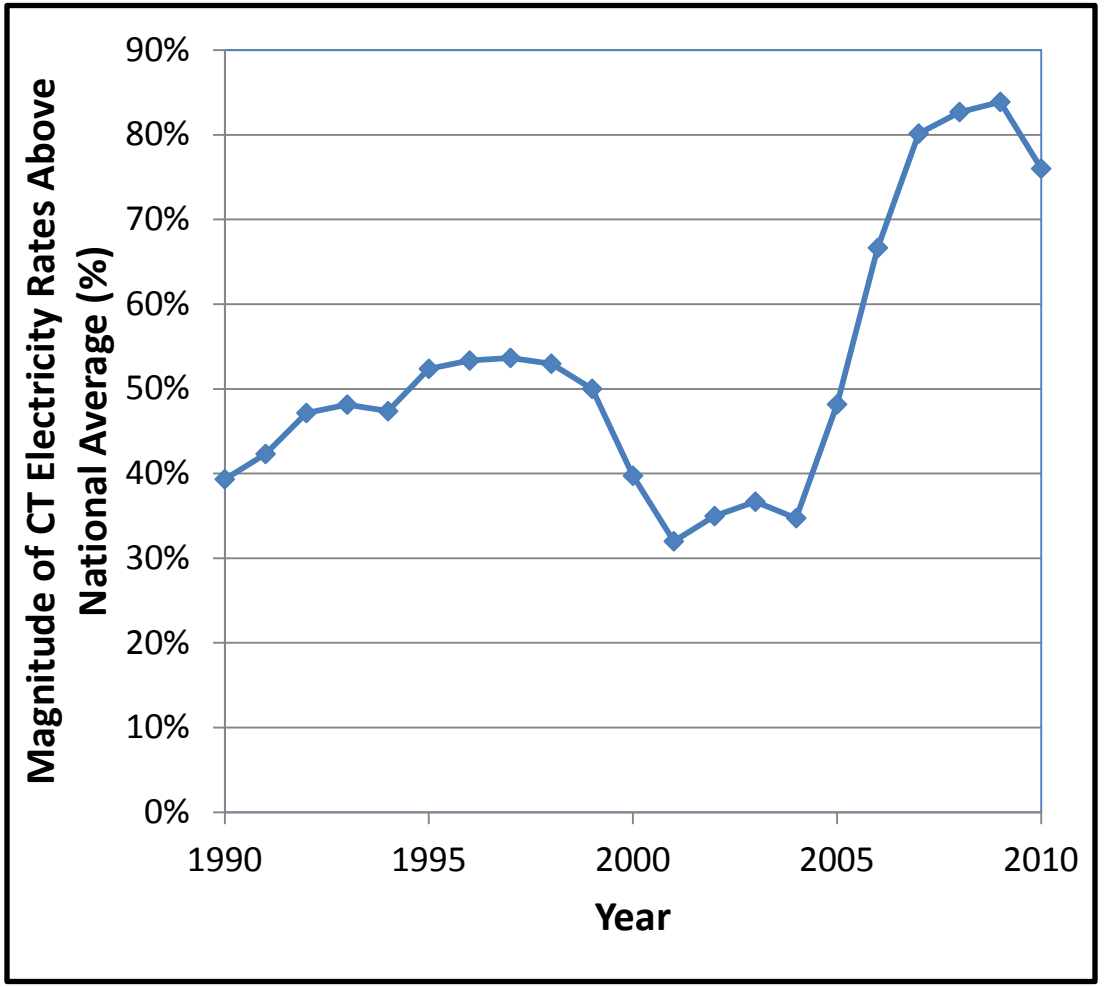
# Connecticut Academy of Science and Engineering
## Findings & Recommendations

# Study Issues

- Connecticut Electric Rates
- Need for Additional or Replacement Baseload Generation and Impact on Electric Rates
- Comparison of Baseload Alternatives
  - Nuclear Power & Natural Gas
- Advances in Nuclear Power
- Advantages of Nuclear Power
- Issues Facing Expansion of Nuclear Power in Connecticut
  - Disposal & Storage of Spent Nuclear Fuel
  - Financing of a 1000 MW Nuclear Power Plant
- Other Considerations
  - Nuclear Safety and Security
  - Nuclear Fuel Reprocessing
  - Siting
  - Energy Education & Public Acceptance

# Connecticut Electric Rates - *Findings*

- State's electricity rates have been the second highest in the country, after Hawaii, since 2007
- High energy costs were the most important issue mentioned in the study's survey
- State's high electricity rates must be dealt with at a regional level because wholesale market is administered by ISO-New England



# Connecticut Electric Rates - *Findings*

- **High electricity rates are likely caused by several factors**
  - **State does not have any indigenous energy resources**
  - **Connecticut legislation deregulated electricity industry requiring electric companies to sell their power plants and buy power on the wholesale market**
  - **Region's dependence on natural gas results in these plants setting the price of electricity about 90% of the time**
  - **Connecticut does not have any natural gas resources — so it must be transported by pipeline from other parts of the United States & Canada — which adds cost to purchase of natural gas for generating electricity**
  - **Congestion of the electrical grid adds to the price of electricity, especially in the southwestern third of the state**
  - **Environmental regulations**
  - **State is relatively high-cost in terms of salary, taxes, & land**

# Connecticut Electric Rates Recommendation

- **Changes are needed in the "deregulated" market so that replacement of inefficient electricity generating facilities or the addition of new in-state low-cost generation more fully translates into lower electricity prices that makes Connecticut more competitive in attracting businesses and creating jobs**

# Need for Additional Baseload Generation & Impact on Electric Rates - *Findings*

- **No clear indicators for the direction in long-term baseload demand in Connecticut or New England (i.e., need for new baseload generation)**

# Need for Replacement Baseload Generation & Impact on Electric Rates - *Findings*

- **ISO-NE analysis found that the replacement of marginal units with new low-cost plant will reduce electric rates**
  - **Addition of 1000 MW of supply would save New England consumers $600 million a year (2005 $) and reduce wholesale electricity rates by 5.7% *(ISO-NE, Electricity Costs White Paper, June 2006)***

# Need for Replacement Baseload Generation - *Findings*

- **Status of existing New England electric nuclear capacity**
  - **Millstone Units 2 and 3 operating licenses extended from 40 to 60 years**
    - **Millstone 2 – 2035**
    - **Millstone 3 – 2045**
  - **Seabrook and Pilgrim are awaiting NRC action on requested 20-year operating license extensions**
  - **Vermont Yankee received a 20-year operating license extension but Vermont lawmakers are trying to shut down the plant**

# Other Factors
# Affecting Future Baseload Capacity - *Findings*

- **Importation of new baseload generation from other regions or Canada**
  - **Need for more transmission capacity**

- **Distributed generation**
  - **Improved economics and reduced vulnerability could prompt a move toward distributed generation**

- **Two natural gas/low sulfur facilities of ~540 MW each are already in the permitting process and could be favorably positioned to respond to Connecticut RFP on new generation**

# Need for Additional and Replacement Baseload Generation and Impact on Electric Rates Recommendation

- **Connecticut should be proactive in developing in-state electricity generating facilities**
- **Potential benefits are:**
  - **Lower electricity rates through lower generation and congestion charges**
  - **Potential job creation from becoming exporter of electricity**

# Comparison of Baseload Alternatives - *Findings*

- **Nuclear Power – YES, if…**
  - **Federal government meets its obligation for disposal/storage of spent nuclear waste**
- **Natural Gas - YES**
  - **Primary fuel for nearly all new generating capacity built in Connecticut and New England since electricity market deregulation**
- **Coal - NO**
  - **In general lower cost fuel option than natural gas**
  - **Primary fuel for generation in many regions of the U.S**
  - **Not considered a likely alternative because of stringent air pollution standards in Connecticut**

# Comparison of Baseload Alternatives - *Findings*

- **Solar and Wind - NO**
  - Not considered baseload sources because they generate electricity on an intermittent basis
- **Biomass (Solid Waste) - NO**
  - Six solid waste burning facilities in the state that generate about 160 MWe
  - Not enough solid waste to generate an additional 1000 MWe
- **Hydroelectric - NO**
  - Hydroelectric power generates 1.6% of state's electricity
  - Future hydroelectric power will likely be small-scale run-of-the-river facilities because of environmental requirements

# Comparison of Baseload Alternatives Recommendation

- **Nuclear Power versus Natural Gas**
  - **Fuel diversity should be promoted by the state as both a strategy to stabilize electricity prices and a regional policy**

# Advances in Nuclear Power - *Findings*

- **Passive safety systems that operate without auxiliary AC power (either off-site or on-site)**
- **Deployment of only standard plant designs that are pre-licensed by the NRC**
- **Combined NRC construction and operating license that streamlines the licensing process**
- **Contracting structure where the majority of risk is on suppliers**
- **Parallel module fabrication and site assembly / erection**
- **Modern construction techniques with advanced computer tools that reduce construction schedule**

# Advances in Nuclear Power - *Findings*

- **Improvements in construction techniques must be demonstrated in US**
  - **Four Generation III+ nuclear plants are currently under construction in the US**
- **Delivering first projects on schedule and within budget and continuing to maintain safe & reliable operation of existing nuclear plant fleet will help establish market confidence**
  - **Reduce or eliminate "nuclear premium" for financing of nuclear projects thus reducing levelized cost of electricity**
  - **Incorporate lessons learned from Fukushima accident in both NRC regulatory process and plant designs - additional costs may result from new safety requirements**

# Advances in Nuclear Power Recommendation

- **First-build construction of Generation III+ nuclear facilities in US should be monitored by CEAB, DEEP and other state leaders to verify advances in construction techniques have achieved anticipated benefits of lower construction costs and shorter construction time frames**

# Advantages of Nuclear Power Compared to Natural Gas CCGT - *Findings*

- **Estimated Job Creation**
  - **For Plant Construction Periods:**
    - **Nuclear Facility: 15,600 jobs/year for 5 years**
    - **Natural Gas CCGT Facility: 8,500 jobs/year for 2 years**
  - **For Plant Operation and Maintenance**
    - **Nuclear Facility: 450 additional jobs at an additional nuclear unit at Millstone *(if at different site - 700 jobs, plus approximately 80 security staff)***
    - **Natural Gas CCGT Facility: 25 jobs**

# Advantages of Nuclear Power Compared to Natural Gas CCGT - *Findings*

- **Diversification of fuel supply**
- **Fuel supply security**
  - **Known global supplies of uranium for at least 80 years at recovery costs below $130/kg U with major suppliers being Canada and Australia**
  - **Appears to be significant reserves of natural gas in the US, but transmission line constraints may limit availability during periods of high demand**
- **Nuclear power generates 69% of the emission-free electricity in the US**
- **High reliability with US nuclear power plant capacity factors averaging about 90% over the last ten years**

# Advantages of Nuclear Power Compared to Natural Gas CCGT Recommendation

- **Nuclear power should be considered for baseload generation to balance the reliance on natural gas — once the federal government has developed a permanent repository or regional centralized interim storage facility for spent nuclear fuel**

# Issues Facing the Expansion of Nuclear Power in CT
## Disposal and Storage of Spent Nuclear Fuel - *Findings*

- **To enable consideration of building a new nuclear power plant in Connecticut, it is necessary to resolve the issue of disposal and storage of spent nuclear fuel in accordance with Sec. 22a-136 of the Connecticut General Statues: Moratorium on Construction of Nuclear Power Facilities**

# Issues Facing the Expansion of Nuclear Power in CT
## Disposal and Storage of Spent Nuclear Fuel - *Findings*

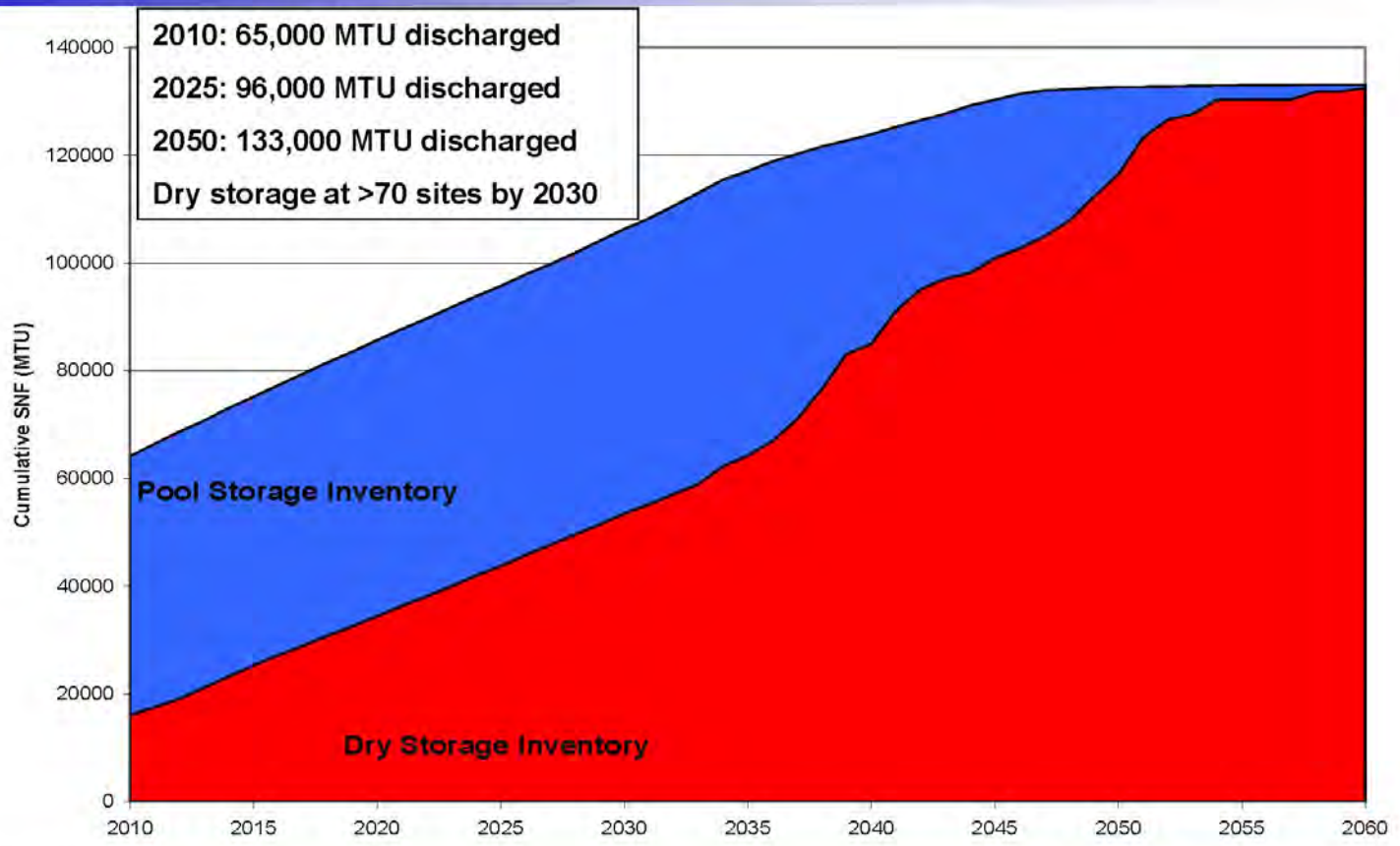
- **US does not have a nuclear spent fuel disposal and storage program**
  - **Obama Administration has decided that the proposed Yucca Mountain repository is not an option**
  - **Financial consequences of federal inaction are that utilities have successfully sued DOE with a potential cost to taxpayers that could exceed $11 billion**

# Issues Facing the Expansion of Nuclear Power in CT
## Disposal and Storage of Spent Nuclear Fuel - *Findings*

- **Federal Blue Ribbon Commission established to provide recommendations for developing a safe, long-term solution to managing the nation's used nuclear fuel and nuclear waste. Preliminary recommendations and conclusions include:**
  - **US should proceed expeditiously to develop one or more permanent deep geological facilities**
  - **Prompt efforts to develop one or more consolidated interim storage facilities as part of an integrated, comprehensive plan for managing the back end of the nuclear fuel cycle**
  - **Access to funds that nuclear utility ratepayers are providing for the purpose of nuclear waste management**
  - **New single-purpose organization to develop and implement a focused, integrated program for the transportation, storage, and disposal of nuclear waste**

# How Much Spent Nuclear Fuel is in the U.S. Today and Projected for the Future & Where is it Located?

## Cumulative U.S. Commercial Spent Nuclear Fuel Inventories – 2010 to 2060 (assumes no nuclear expansion, 60-year life)




Aug 2010, Energy Resources International, Inc.

# How Much Spent Nuclear Fuel is in the U.S. Today and Projected for the Future & Where is it Located?

- **Spent Fuel Pools**
  - 104 operating reactors *(plus all SNF from operation of Millstone 1 [shutdown] remains in its spent fuel pool)*
  - SNF must remain in these pools 5-10 years to cool adequately
  - Most pools use high density SNF storage racks and are near full (retaining full core off-load capability)
- **Dry Cask Storage Facilities (ISFSIs)**
  - 57 currently in operation
  - EPRI estimates that all operating power reactors will have ISFSIs in operation by 2025

# Connecticut Yankee – Dry Cask Storage Facility

# Millstone Power Station – Dry Cask Storage Facility

# Issues Facing the Expansion of Nuclear Power in CT
# Disposal and Storage of Spent Nuclear Fuel Recommendations

- **Study committee agrees with the recommendations made by the Blue Ribbon Commission that there is an urgent need to expeditiously develop one or more geological disposal and interim storage facilities for spent nuclear fuel**

- **State of Connecticut should join other affected states and aggressively demand that the federal government meet its legal obligation regarding management of spent fuel and high-level nuclear waste**

# Issues Facing the Expansion of Nuclear Power in CT
## Financing of a 1000 MW Nuclear Power Plant - *Findings*

- **Overnight cost and financing are the most significant factors impacting the levelized cost of electricity (LCOE)**
- **Elimination of nuclear financing premium makes the LCOE of nuclear power very competitive with that of a CCGT power plant, BUT**
  - **Unlikely that merchant owner will decide that the financial risk is worth the potential benefits and/or be able to obtain financing at an acceptable rate for construction of a nuclear power plant is estimated to have an overnight cost of $4-5 billion**

# Issues Facing the Expansion of Nuclear Power in CT
# Financing of a 1000 MW Nuclear Power Plant Recommendation

- **State policies that reduce financial risk and provide confidence to allow for private investment are needed**
  - **Loan guarantees beyond the first-build reactors**
  - **Long-term contracts for the electricity generated**
  - **Economic incentives for fuel diversification**
  - **Economic incentives for emission-free electricity generation**
  - **Appropriate public / private business models that balance risk**

# Other Considerations: Nuclear Safety - *Findings*

- **Institute of Nuclear Power Operations (INPO) was formed to continually improve and address operational procedures as a result of 1979 Three Mile Island accident**
  - **Safety record has improved dramatically since the late 1980s when data was first collected** *(See Slide 18)*

# Other Considerations: Nuclear Security- *Findings*

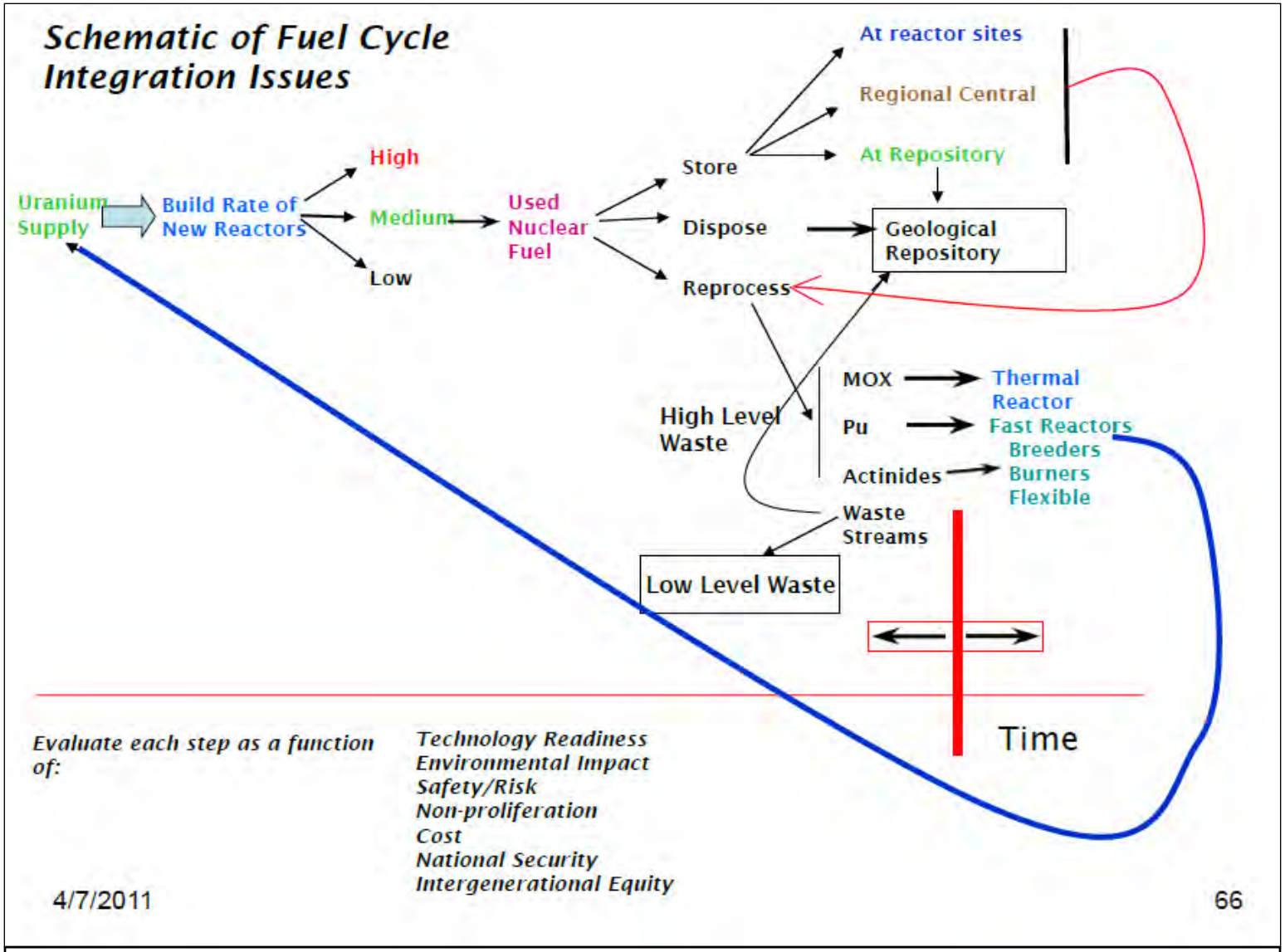
- **Security includes physical security of the site, fuel supply, and cybersecurity**
  - **"Hardened" facilities with substantial protection from natural and man-made external threats because of their robust reinforced concrete structures**
    - **Potential area of vulnerability is wet storage of spent fuel**
  - **Large visible security system as well as other not-so-visible measures to deter and stop a terrorist attack**
  - **Cybersecurity is an issue facing electricity generation and transmission facilities that rely on large centralized power plants**
    - **Nuclear regulations do not allow for remote operation of a facility thus reducing the opportunity for a terrorist to take computer control of an operating facility**

# Other Considerations: Nuclear Safety & Security Recommendation

- **Safety cannot be taken for granted**
- **Imperative that state and federal government continue to monitor and assess the safety record of the nuclear industry**
- **Continued on-site inspections, simulated terrorist attacks, and incorporation of the latest safety technologies are needed to increase the trust and confidence of the public in nuclear technology**

# Other Considerations
# Nuclear Fuel Reprocessing - *Findings*

- **Reprocessing of spent nuclear fuel enables separation of the useful fuel remaining and potential reduction of the volume and toxicity of the waste.**




**Courtesy of Andrew Kadak, Director, Nuclear Services, Exponent, Engineering & Scientific Consulting**

# Other Considerations
# Nuclear Fuel Reprocessing - *Findings*

- **US decided in the 1970s to follow a once-through fuel cycle to reduce the potential of nuclear proliferation**
- **Blue Ribbon Commission could not reach consensus on the desirability of closing the nuclear fuel cycle**
- **Research, development, and deployment should continue on a range of fuel cycle technologies that have the potential to deliver societal benefits**

# Other Considerations
# Nuclear Fuel Reprocessing - Recommendations

- **The state should monitor federal activities with regard to development and implementation of a nuclear fuel cycle**
- **Advances in this area have the potential to reduce the volume of high-level radioactive waste and increase the amount of energy that can be obtained from uranium reserves**
- **Study Committee concurs with the Blue Ribbon Commission regarding the urgent need to site and license a permanent repository for spent nuclear fuel regardless of decisions regarding the nuclear fuel cycle**

# Other Considerations: Siting - *Findings*

- **Siting of electricity generating facilities in Connecticut and New England is a difficult process**

- **Study's survey indicated that residents are more accepting of renewable energy — but reality has shown that these facilities (e.g., wind farms) are as difficult to site as a fossil fuel plant**

# Other Considerations: Siting - Recommendation

- **Siting of a new nuclear facility should be located at the Millstone Power Station in Waterford or Connecticut Yankee in Haddam Neck**
  - **Millstone has the infrastructure already available & the Connecticut Yankee site still has some transmission infrastructure**
  - **Expected that there would be local support because the communities surrounding these facilities are familiar with nuclear power**

# Other Considerations: Energy Education - *Findings*

- **Study's survey of Connecticut residents indicated that respondents are misinformed about many energy issues**
  - **48% of the respondents indicated that there weren't any nuclear power plants operating in Connecticut or were not sure if any nuclear power plants were operating in Connecticut**
  - **84% of the respondents had never looked for information about electric energy issues**

# Other Considerations: Public Acceptance - *Findings*

| Electricity Generation Technology | Very or Extremely Favorable |
|---|---|
| Nuclear Power | 22% |
| Fossil Fuels | 25% |
| Renewable and Green-Based Energy | 84%* |

**Siting of wind farms, trash-to-energy plants, and dam-supplied hydroelectric facilities generally has had a high level of public opposition which contradicts the high level of support indicated by the survey*

- **Electricity generation industry *(all energy sources)* appears to want to keep a low profile, but the lack of public engagement detracts from their ability to generate public support for new projects**

# Other Considerations
# Energy Education and Public Acceptance Recommendation

- **Energy education is needed so that the public can be informed about the state's energy future in regard to nuclear power, fossil fuels, renewable energy, and conservation**
  - **K-12 curriculum**
  - **Seminars at state's colleges and universities**
  - **Public service announcements**

# Concluding Remarks

- **Political leadership and long-term, stable energy policies are needed so Connecticut's residents and businesses can benefit from low-cost, reliable, safe, sustainable, diverse, and environmentally friendly sources of electricity, and from energy efficiency and peak demand reduction programs**

- **Uncertainty and changing future regulations and policy (e.g., carbon tax, incentives, and tax policy) will limit future investment in new electricity generation, continuing to put Connecticut at a competitive disadvantage because of high electricity rates**

# Thank You

## Contact for Additional Information:

**Connecticut Academy of Science and Engineering**
**Richard H. Strauss, Executive Director**
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# The Economic Impact of Nuclear Power Generation in Connecticut

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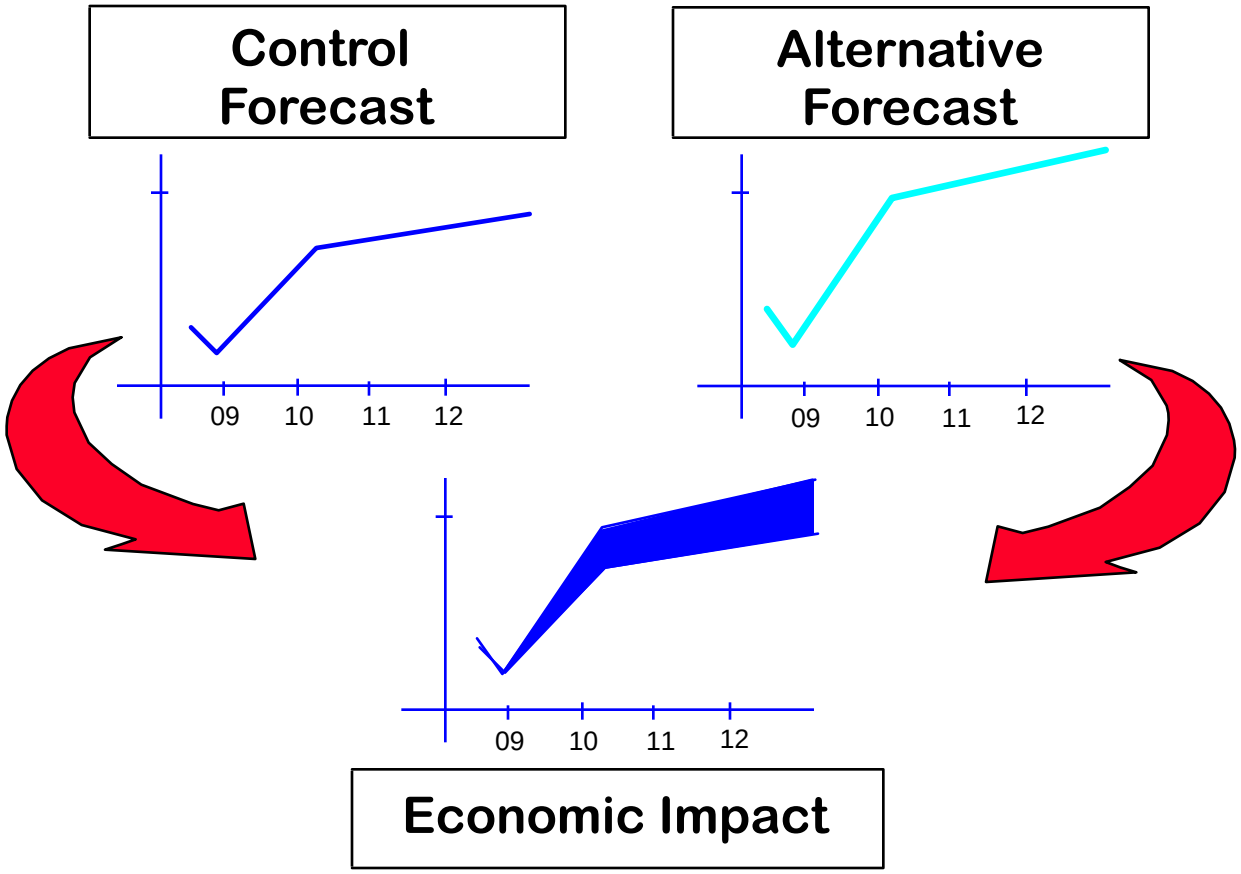
Dale Shannon, Senior Economist, CERC

# Scope of Study

- Assess the economic and fiscal impacts of replacing or adding baseload generation in CT.
  - Replace existing nuclear unit(s) at Millstone with a 1,000 MWe nuclear or CCGT plant
  - Add 1,000 MWe nuclear or CCGT plant to Millstone or CT Yankee

# Estimating Economic Impact



# Common Economic Modeling Assumptions

- Each unit receives its LCOE
- No net new job creation
- No net new procurement (B2B activity)
- No net new electricity sales
- Merchant operators
- Decommissioning phase greatly compressed into one year (cost incl. In nuclear LCOE)

# Common Modeling Assumptions

- No additional cost for spent fuel storage
- Natural gas pipeline extension included for CCGTs
- Workers receive utility industry average wage
- Workers live in CT
- Modeling time begins in 2009 and ends in 2050

# Assumptions: Replacement

- Replacements are large construction projects at the Millstone campus
  - No net new jobs, capacity, procurement (B2B)
  - Use MIT 2009 cost & operational parameters with capacity factor for nuclear increased to 90%.
  - Electricity sales do not change (demand is constant)

# Economic Impact Drivers: Replacement

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | Total |
|---|---|---|---|---|---|---|---|
| Nuclear plant construction & nuclear decommission | $405 | $1,093 | $1,391 | $1,159 | $456 | $887 | $5,391 |
| CCGT plant construction & nuclear decommission | | | | $493 | $507 | $887 | $1,887 |
| Pipeline construction | | | | $25 | $25 | | $50 |
| Total CCGT | | | | $543 | $557 | $887 | $1,937 |

CCGT: Vendor EPC overnight cost = $850 million in 2007$; pipeline extension cost $5 million/mile for 10 miles

AP 1000: Vendor EPC overnight cost = $3.333 billion in 2007$; construction outlays: 10%, 25%, 31%, 25%, 10%

# Economic Impacts

| Economic Variable | | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|
| New Total employment | Nuclear | 7,993 | 20,320 | 24,756 | 19,249 | 6,021 | 12,087 |
| | CCGT | NA | NA | NA | 8,685 | 8,368 | 13,679 |
| New Construction Jobs | Nuclear | 5,708 | 14,660 | 18,194 | 14,636 | 5,365 | 9,922 |
| | CCGT | NA | NA | NA | 6,263 | 6,187 | 10,245 |
| New State GDP (mil nominal $) | Nuclear | $460.5 | $1,214.9 | $1,495.1 | $1,161.2 | $313.4 | $725.5 |
| | CCGT | NA | NA | NA | $543.5 | $531.1 | $889.9 |
| New Output (Sales) (mil nominal $) | Nuclear | $780.5 | $2,051.6 | $2,516.2 | $1,948.9 | $530.0 | $1,207.3 |
| | CCGT | NA | NA | NA | $917.4 | $894.6 | $1,474.7 |
| New Personal Income (mil nominal $) | Nuclear | $393.6 | $1,055.8 | $1,400.3 | $1,225.8 | $556.5 | $902.2 |
| | CCGT | NA | NA | NA | $472 | $507.80 | $867.20 |
| Net New State Revenue (mil nominal $) | Nuclear | $77.78 | $190.7 | $218.66 | $147.7 | $0.53 | $72.67 |
| | CCGT | NA | NA | NA | $87.65 | $77.71 | $131.5 |

Source: The REMI model and author's calculations.

# Assumptions: Baseload Addition

- Marginal units are displaced in CT
  - These plants cease operation
  - Released labor & procurement absorbed by new units at Millstone or CT Yankee site.
  - No net new jobs or procurement
  - Electricity sales do not increase b/c demand is constant
  - Wholesale price declines as higher cost marginal units leave the market.

# Assumptions: Baseload Addition

- Retail price declines 50% of wholesale decline (2.85%) [ISO-NE, June 2006, White Paper]
- Omit siting & permitting costs & time
- No net new jobs, capacity, procurement
- Use MIT 2009 cost & operational parameters with capacity factor for nuclear increased to 90%.
- Same economic & fiscal impact for Millstone or CT Yankee sites

# Economic Impact Drivers: Addition

- Construction expenditure and schedule same as replacement
- CT ratepayers see 2.85% reduction in their electric bills absent other changes
- Decommission occurs in 2074 & lasts for 20+ years (assuming 60-year life)
- No SR/MR change in electricity demand due to price reduction (=> sales flat)

# Economic Impact Drivers: Addition

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 - 2050 |
|---|---|---|---|---|---|---|
| Retail Electricity Price Reduction | NA | NA | NA | NA | NA | -2.85% |
| Nuclear plant construction & nuclear decommission | $405 | $1,093 | $1,391 | $1,159 | $456 | NA |
| CCGT plant construction & nuclear decommission | | | | $493 | $507 | NA |
| Pipeline construction | | | | $25 | $25 | NA |
| Total CCGT | | | | $543 | $557 | NA |

CCGT: Vendor EPC overnight cost = $850 million in 2007$; pipeline extension cost $5 million/mile for 10 miles

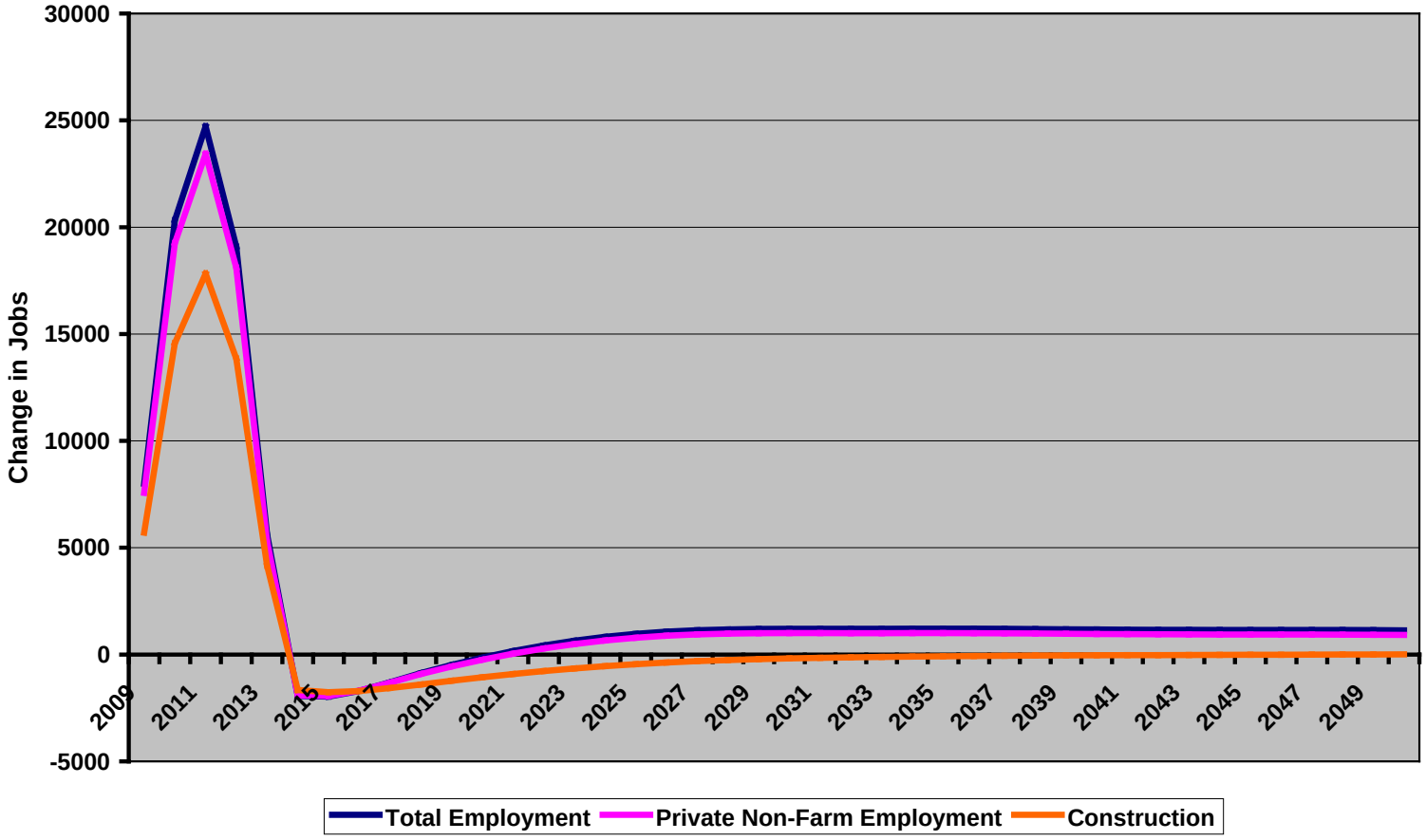
AP 1000: Vendor EPC overnight cost = $3.333 billion in 2007$; construction outlays: 10%, 25%, 31%, 25%, 10%

# Economic Impacts

| | Annual Average Change from Baseline (2009-2050) | | | |
|---|---|---|---|---|
| Economic Variable | Add Nuclear Plant at Millstone or CT Yankee | | Add CCGT Plant at Millstone or CT Yankee | |
| Total New Employment (Persons) | 2,420 | | 1,333 | |
| New Construction (Jobs) | 957 | | 254 | |
| | Ann. Avg. Change | NPV | Ann. Avg. Change | NPV |
| New Gross Domestic Product (mil nominal $) | $516.6 | $7,594.8 | $471.1 | $5,768.4 |
| New Output (mil nominal $) | $845 | $12,576.3 | $773.6 | $9,581.7 |
| New Personal Income (mil nominal $) | $363.6 | $6,154.1 | $247.6 | $3,291.8 |
| Net New State Revenue (mil nominal $) | $27.4 | $586 | $18.6 | $306.2 |

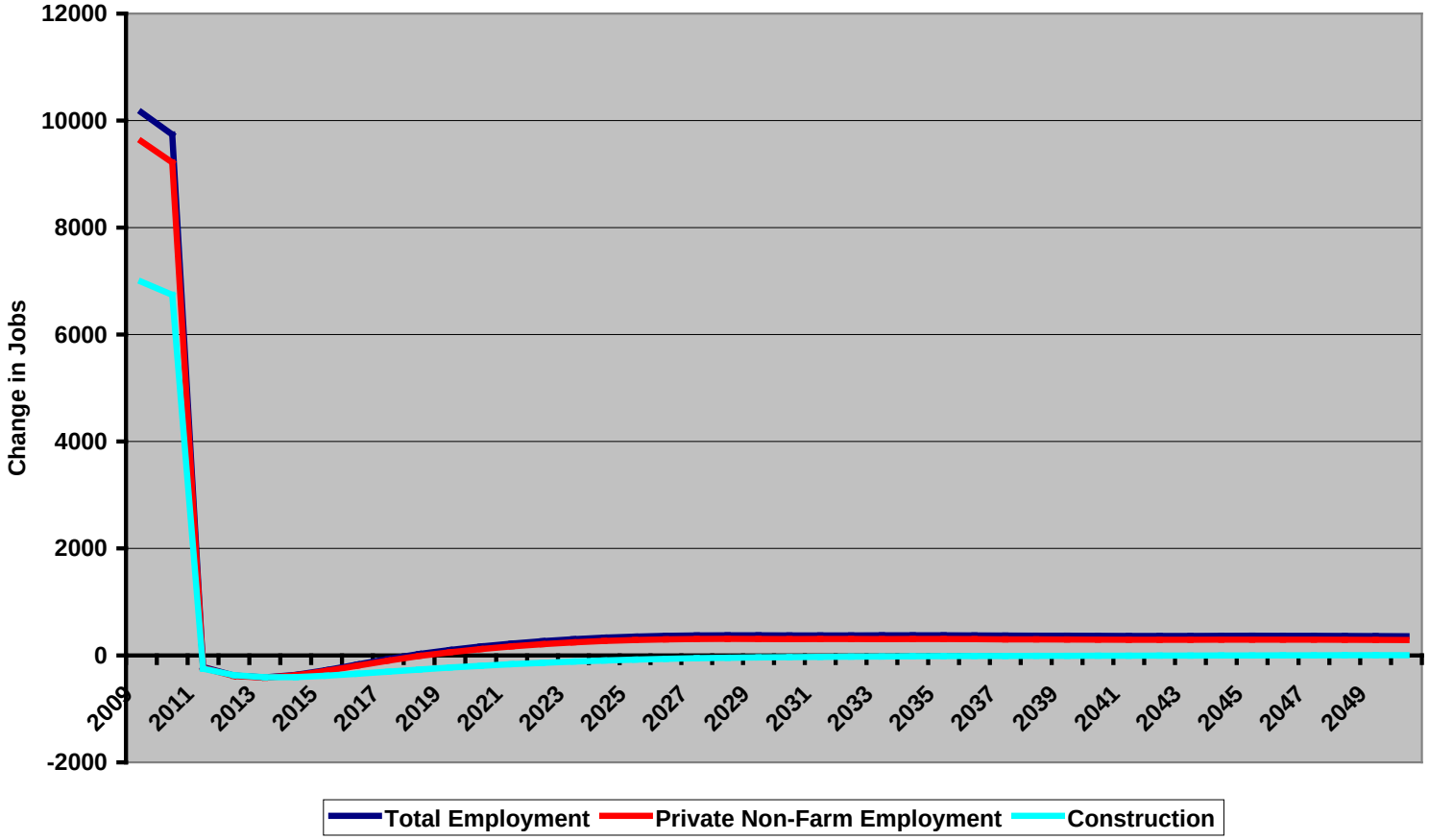
# Economic Impacts

**Changes in Total, Non-farm & Construction Jobs: New Nuclear Plant at Millstone or CT Yankee**



# Economic Impacts

**Employment Changes in Total Nonfarm and Construction: New CCGT Plant at the CT Yankee Site**

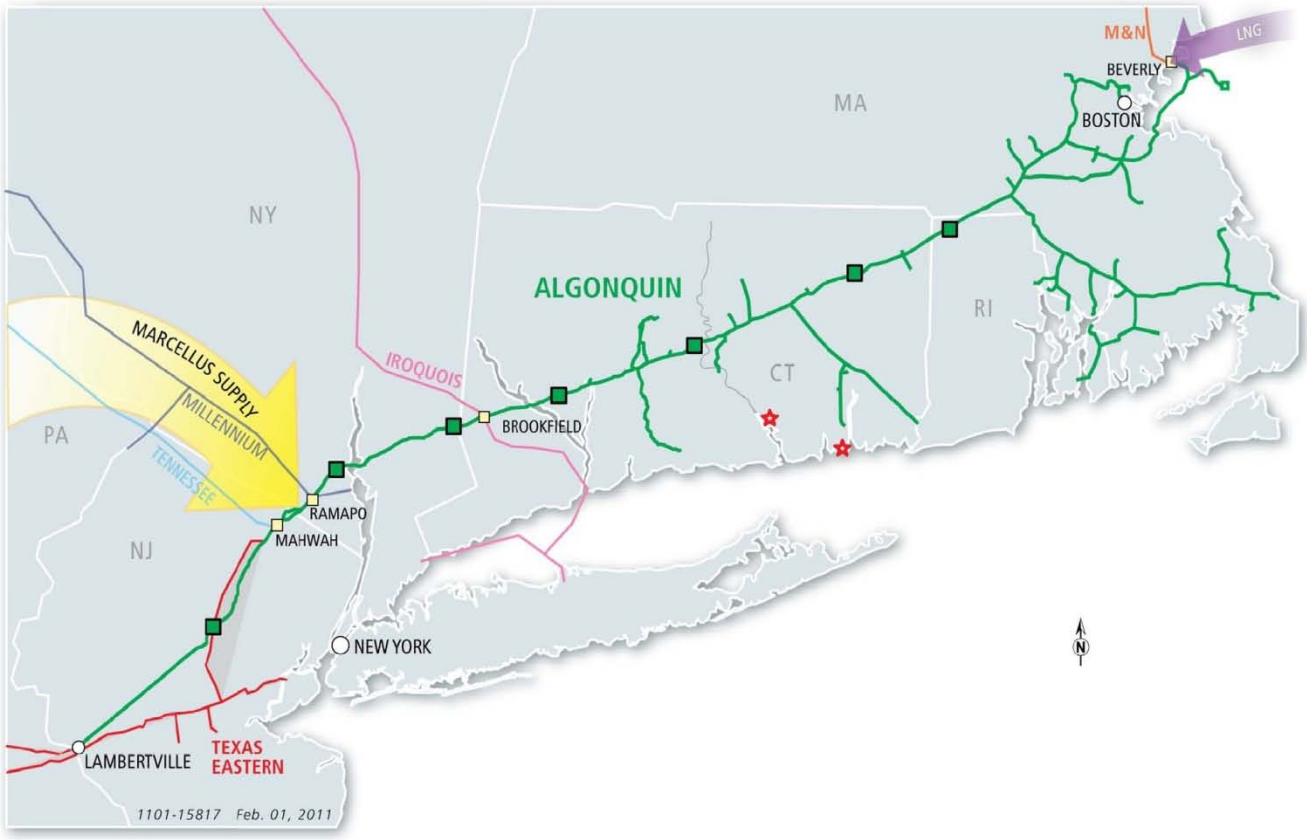


# Discussion: Natural Gas

- Natural Gas Pricing
  - Assume ‘national’ price.
  - Changes in price for any reason change the price for everyone.
  - No competitive disadvantage for CT (excl. delivery costs).
  - Adding CCGT increases CT’s $CO_2$ emission
    - RGGI and RPS targets more difficult to achieve
    - Increased vulnerability to price volatility & supply disruption

# Discussion: Natural Gas

- For CCGT plant at Millstone or CT Yankee, need pipeline extension



# Regional Electricity Market

- Regional wholesale markets administered by ISO-NE:
  - Day-Ahead
  - Real-Time
  - Forward Capacity
  - Ancillary Services
    - Regulation
    - Forward Reserve
    - Real-Time Reserve Pricing
    - Voltage Support
    - Other Services & Products

# Regional Electricity Market

- Energy market pays all generators participating in the day-ahead and real-time markets the price bid by the marginal unit just satisfying the last unit of forecast demand.
- These payments may not cover all costs that generators face and generators may participate in other markets to recoup their average total (fixed plus variable) costs.

# Regional Electricity Market

- Because baseload units, especially nuclear units, have low fuel costs relative to inframarginal (natural gas) units, they typically bid zero in the energy markets.
- As baseload capacity is added, it displaces marginal (higher priced generation) units & reduces the wholesale electricity price in the region.

# Regional Electricity Market

- Because nuclear power is relatively inexpensive to generate, adding nuclear baseload capacity drives down the prices for capacity and reserve otherwise provided by units that have higher fuel costs.

# Levelized Cost of Electricity

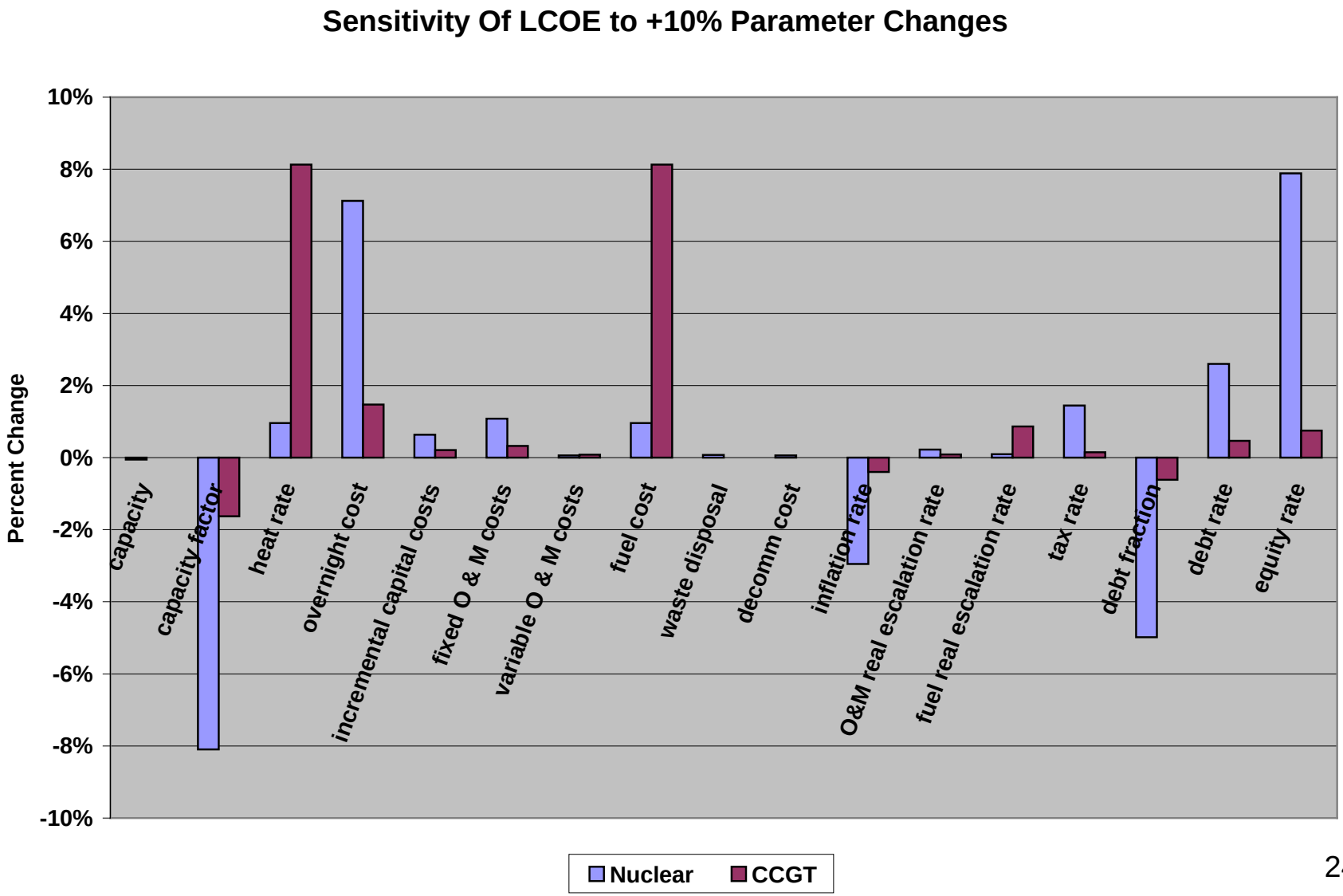
- LCOE represents the constant (level) wholesale price generators receive over the life of a power plant that is necessary to cover all operating expenses including taxes and provide an acceptable return to investors.

- LCOE provides a uniform way to compare the wholesale cost of energy across technologies because it takes into account the installed system price and associated costs such as financing, land, insurance, operation and maintenance and depreciation, among others.

# Levelized Cost of Electricity

- LCOE is the net present value of total life cycle costs of the power plant divided by the quantity of energy produced over the plant's life.
- Accounts for carbon costs, inflation, returns to debt & equity (risk) & fuel escalation rates.
- LCOE studies document wide variation

# LCOE Sensitivity Analysis



# Nuclear Construction & Operational Cost Assumptions

## AP1000: Advanced Pressurized Water Reactor

- **Once-through fuel cycle**
- **40-year economic life (see below for a 60-year economic life LCOE estimate)**
- **Capacity factor: 90% (increased from Du and Parsons [2009] study with new information)**
- **Heat rate: 10,400 Btu/kWh**
- **Overnight cost in 2007 dollars: $4,000/kWe**
- **O&M fixed costs: $56.44/kW/yr**
- **O&M variable costs: 0.42 mills/kWh**
- **O&M real escalation rate: 1%/yr**
- **Incremental capital costs: $40/kW/yr**
- **Fuel costs: $0.67/mmBtu**
- **Inflation rate: 3%/yr**
- **Real fuel escalation rate: 0.5%/yr**
- **Tax rate: 37%**
- **Construction period: 5 years**
- **Financing:**
    - **Equity return: 15% nominal net of income taxes**
    - **Debt return: 8% nominal**
    - **Inflation: 3% annual**
    - **Income Tax rate (applied after expenses, interest & tax depreciation): 37%**
    - **Equity: 50%**
    - **Debt: 50%**
    - **Weighted Avg. cost of capital: 10%**
    - **Depreciation: 15-year MACRS schedule**
- **Waste fee: 1 mill/kWh**
- **Decommissioning cost: $700 million in 2007 dollars**
- **Construction schedule: startup year - 5=10%, year - 4=25%, year - 3=31%, year - 2=25%, year - 1=10%**

# CCGT Construction & Operational Cost Assumptions

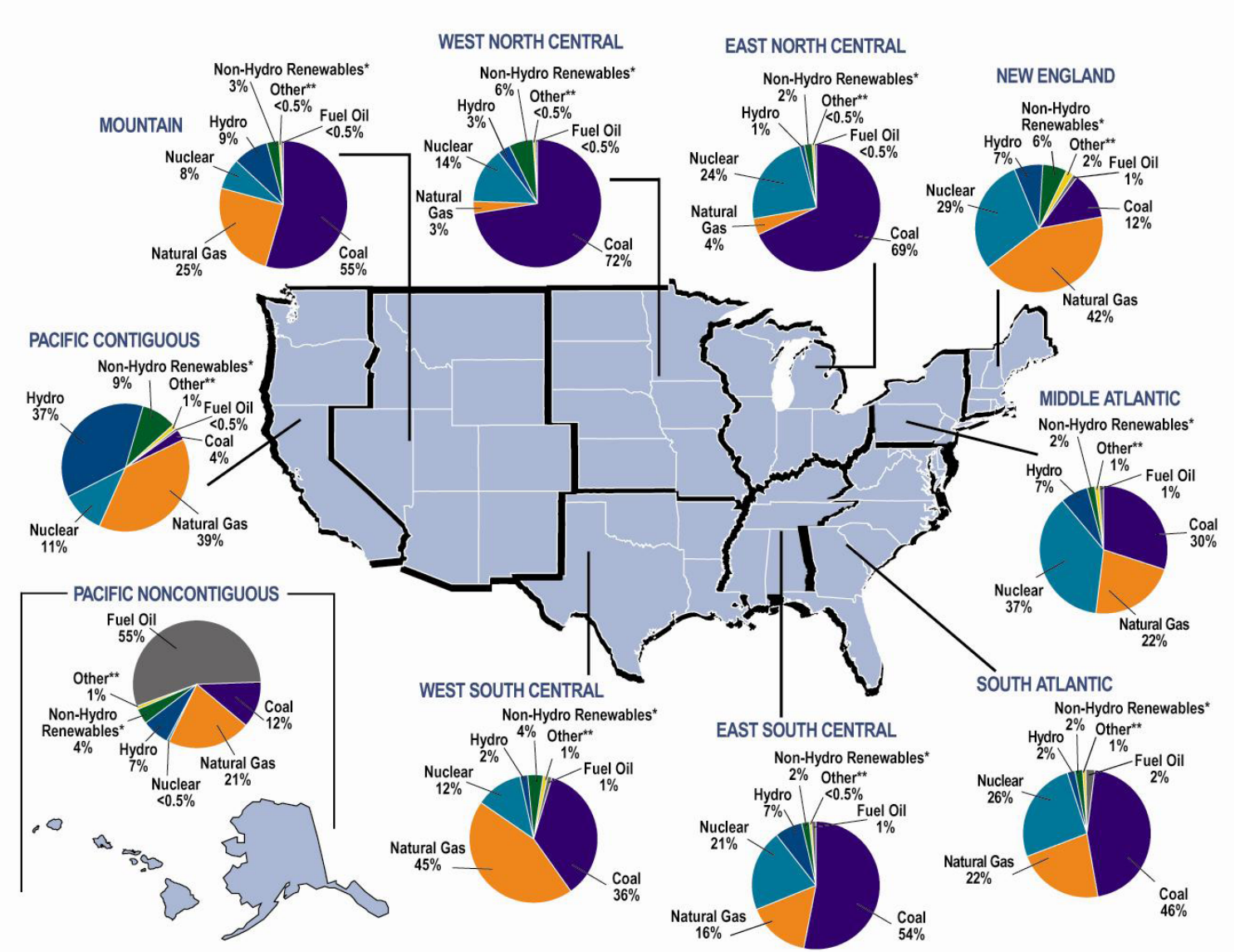
## Natural Gas CCGT

- **40-year economic life**
- **Capacity factor: 85%**
- **Heat rate: 6,800 Btu/kWh**
- **Overnight cost in 2007 dollars: $850/kWe**
- **Incremental capital costs: $10.20/kWh/yr**
- **O&M fixed costs: $12.65/kW/yr**
- **O&M variable costs: 0.41 mills/kWh**
- **O&M real escalation rate: 1%/yr**
- **Fuel cost: $7.00/mmBtu**
- **Inflation rate: 3%/yr**
- **Real fuel cost escalation rate: 0.5%/yr**
- **Tax rate: 37%**
- **Construction period: 2 years, half in each year**
- **Financing:**
    - **Equity return: 12% nominal net of income taxes**
    - **Debt return: 8% nominal**
    - **Inflation: 3%/yr**
    - **Income Tax rate: 37%**
    - **Equity: 40%**
    - **Debt: 60%**
    - **Weighted Avg. cost of capital: 7.8%**
    - **Depreciation: 15-year MACRS schedule (identical to the nuclear plant)**
- **Carbon intensity: 14.5 kg-C/mmBtu**
- **Carbon Cost: $0/tCO2**
- **Construction schedule: startup year - 2=50%, year - 1=50%**

# LCOE Values & Variations

- These assumptions => \$0.079/kWh for nuclear & \$0.065/kWh for CCGT
- 60-year nuclear economic life => $LCOE_{nuc}$=\$0.076
- 1.64% gas escalation rate => $LCOE_{gas}$ = \$0.079/kWh
- \$41.17/$tCO_2$ tax => $LCOE_{gas}$ = \$0.079/kWh (RGGI price = \$1.90/$tCO_2$)

# Fuel Diversity






Source: Edison Electric Institute, May 2010.

# Fuel Diversity

- Shannon-Weiner Index: $\Delta_a = \sum_{i=1}^{I} - p_i \ln(p_i)$
  - $p_i$ is the proportional representation of option *i* in the portfolio under consideration
- One considers a range of portfolios each with a different combination of fuels &/or technologies
- Taken together, these portfolios form an efficient frontier of diversification choices

# Fuel Diversity

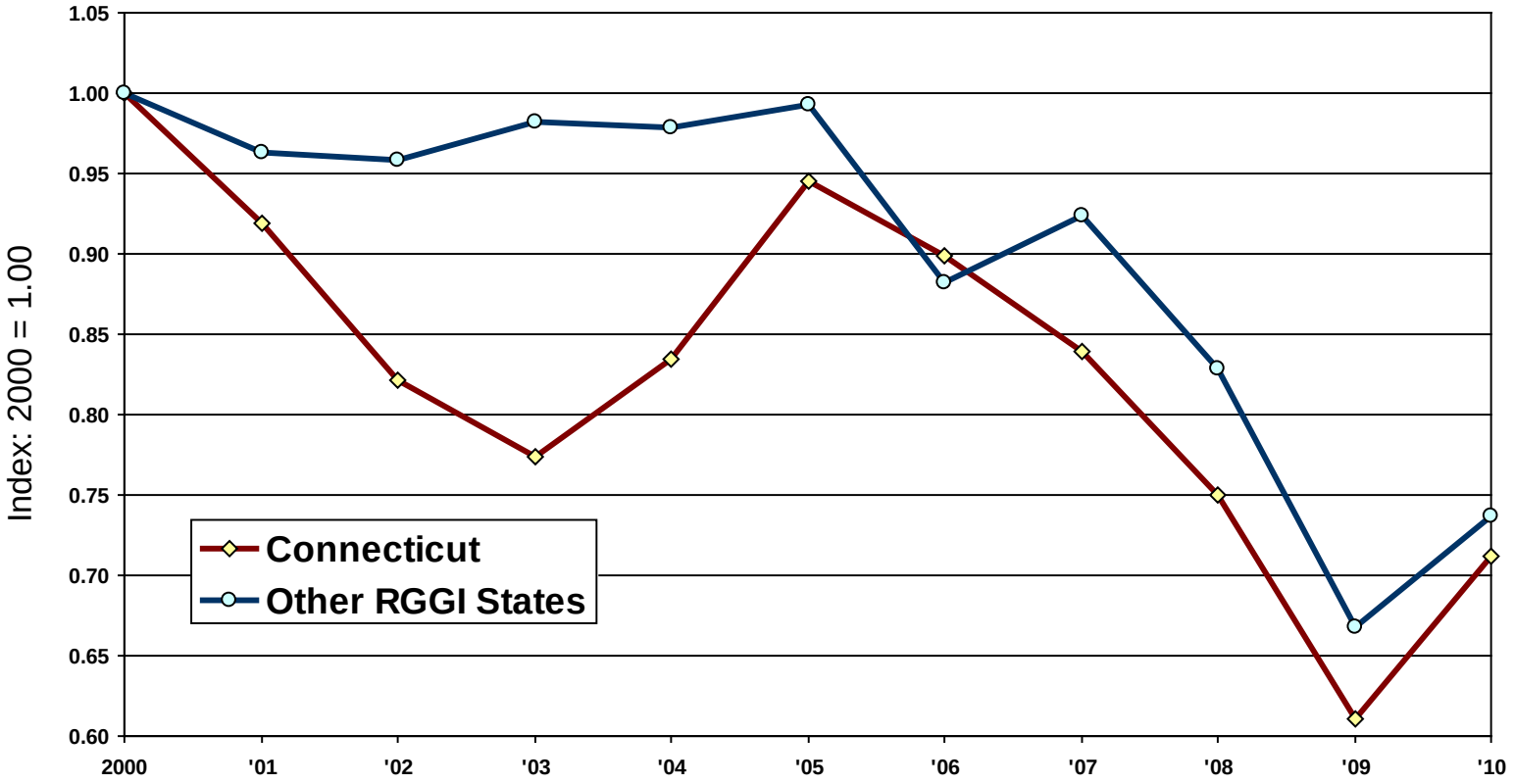
- The efficiency frontier shows a range of possible diversification choices that the region may adopt based on its preferences for certain fuels/technologies and risk.
- ISO-NE's 2007 study shows that adding 5,400 MWe of capacity from a single, non-gas technology does not change the region's disproportionate dependence on gas.

# The RGGI

- Ten states in 2005 formed a regional carbon market.
- RGGI capped $CO_2$ production for 2009 through 2013 that will be reduced from 2014 through 2018 by 2.5% when $CO_2$ production will be capped 10% below the initial cap.
- Allowances auctioned and sold directly are permission to produce one ton of $CO_2$

# The RGGI

**Trend in CO2 Production for Connecticut and Other RGGI States**

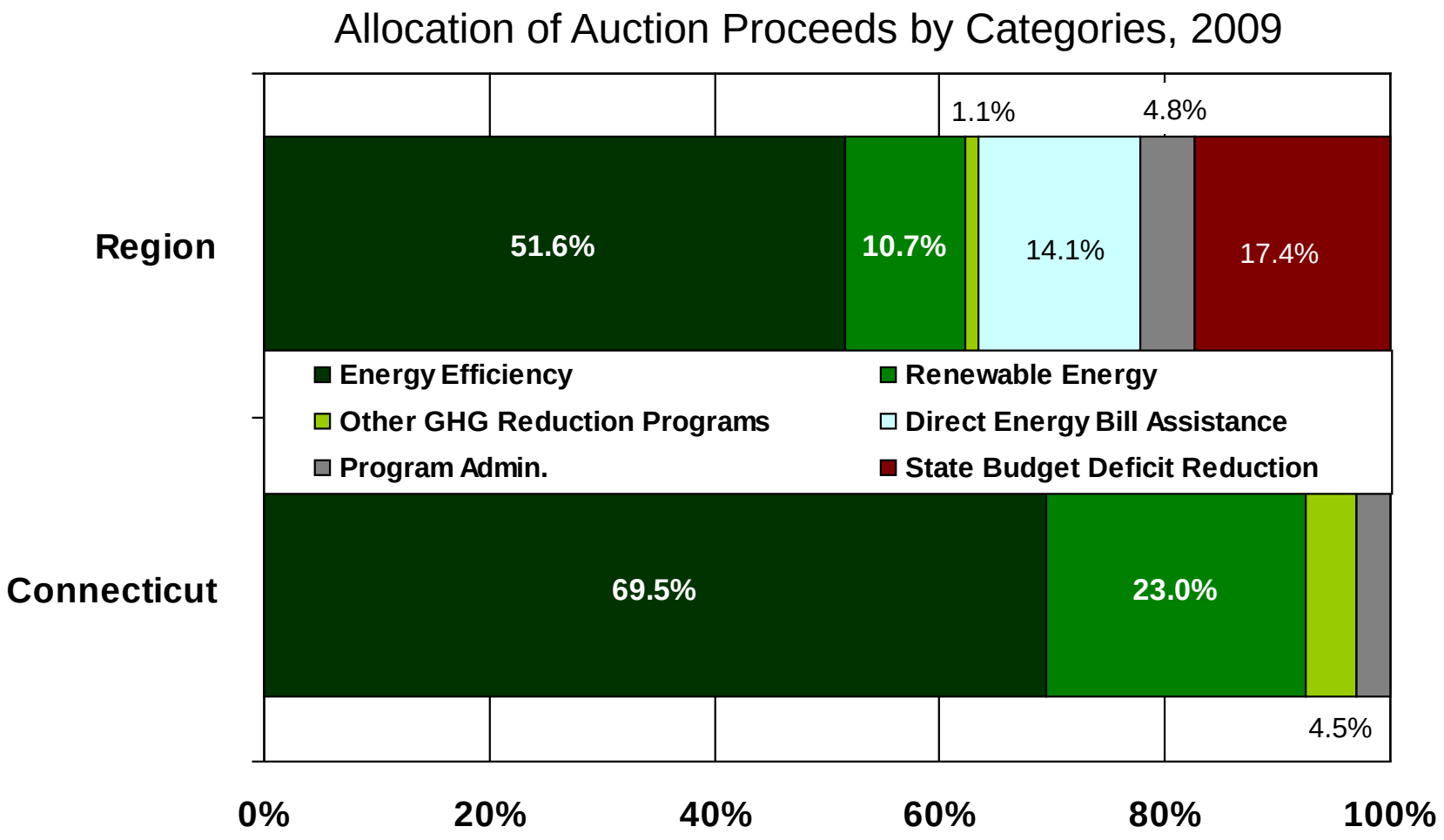



Source: RGGI

# The RGGI

- As of the March 2011 auction, 346 million transactions occurred since the 2009 start.
- Cumulative proceeds amount to $860 million in the RGGI states.
- RGGI distributes 91.5% of proceeds from auctions to states.

# The RGGI




Source: RGGI, Inc. http://www.rggi.org/docs/Investment_of_RGGI_Allowance_Proceeds.pdf

# Takeaways

- LR economic impacts are small (~1%)
  - Large in construction period
  - Most conservative assumptions
- Region's heavy dependence on gas is not changed with a single 1,000 MWe addition.
  - Fuel diversity not impacted until we displace 6,000 Mwe
- Price of gas ↑ makes nuclear relatively attractive.
  - But, no competitive disadvantage to CT
- RGGI raised CT costs but increased efficiency and alt. energy deployment (CCEF & CEEF).

Thank you!

Questions???

*Presentation to*

# Connecticut Energy Advisory Board

## Assessing Connecticut Residents' Opinions of Nuclear Power

*Key Findings*

May 6, 2011

CERC start here
Connecticut Economic Resource Center, Inc.

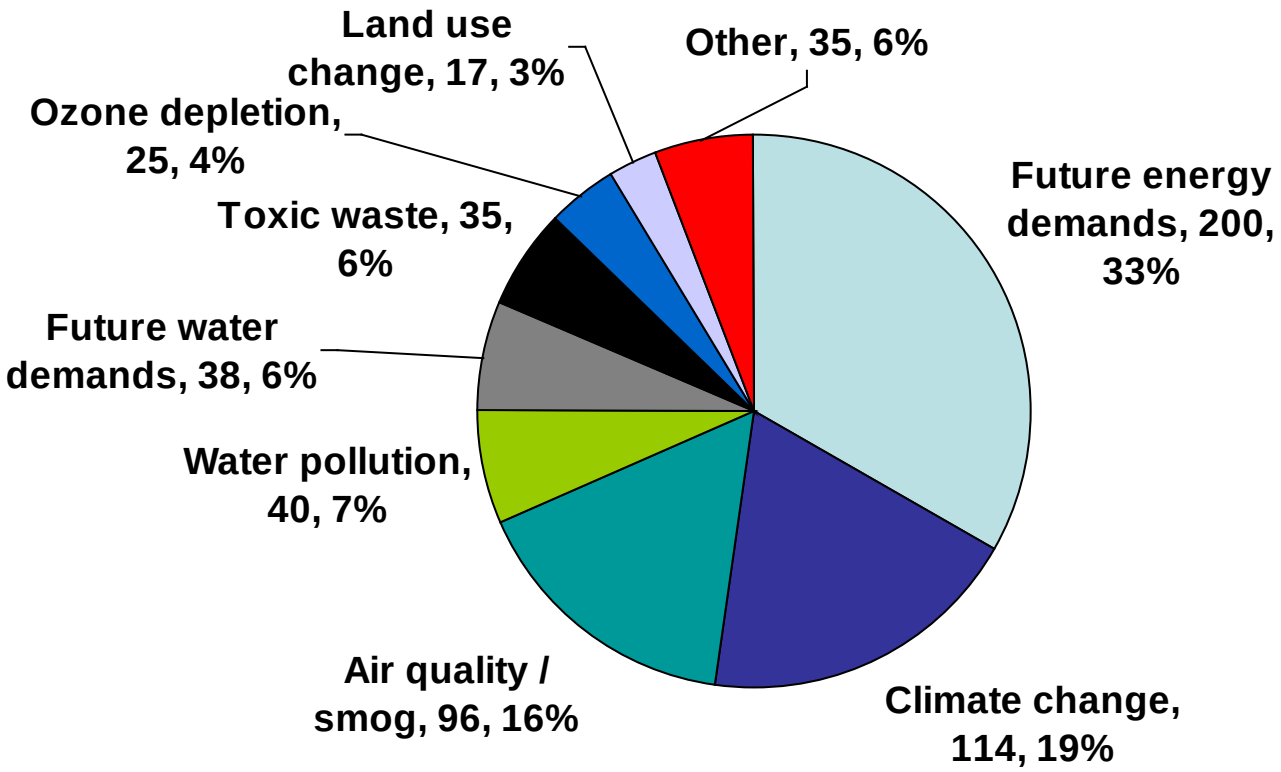
# Survey Design

- Telephone survey conducted among Connecticut residents who were at least 18 years old
- 600 interviews were evenly distributed among
  - Fairfield County
  - Hartford & New Haven counties
  - New London County
  - Rest of the state
- Interviewing completed between October and November 2010

# The respondents were evenly distributed among counties with representation among age and gender.

| | Total | Age | | | | | Gender | |
|---|---|---|---|---|---|---|---|---|
| | | 18-29 | 30-44 | 45-54 | 55-64 | 65+ | Male | Female |
| Base | 600 | 15 | 159 | 150 | 112 | 143 | 257 | 343 |
| Fairfield County | 150 | 1 | 39 | 36 | 33 | 38 | 63 | 87 |
| Hartford and New Haven Counties | 150 | 4 | 37 | 38 | 29 | 35 | 67 | 83 |
| New London County | 150 | 4 | 46 | 30 | 21 | 42 | 65 | 85 |
| All other counties | 150 | 6 | 37 | 46 | 29 | 28 | 62 | 88 |

# Future energy demands were first on the minds of one-third of the respondents.




**Which is the most important environment issue or issues the United States today? (First Mention of 600 Respondents)**

CERC start here
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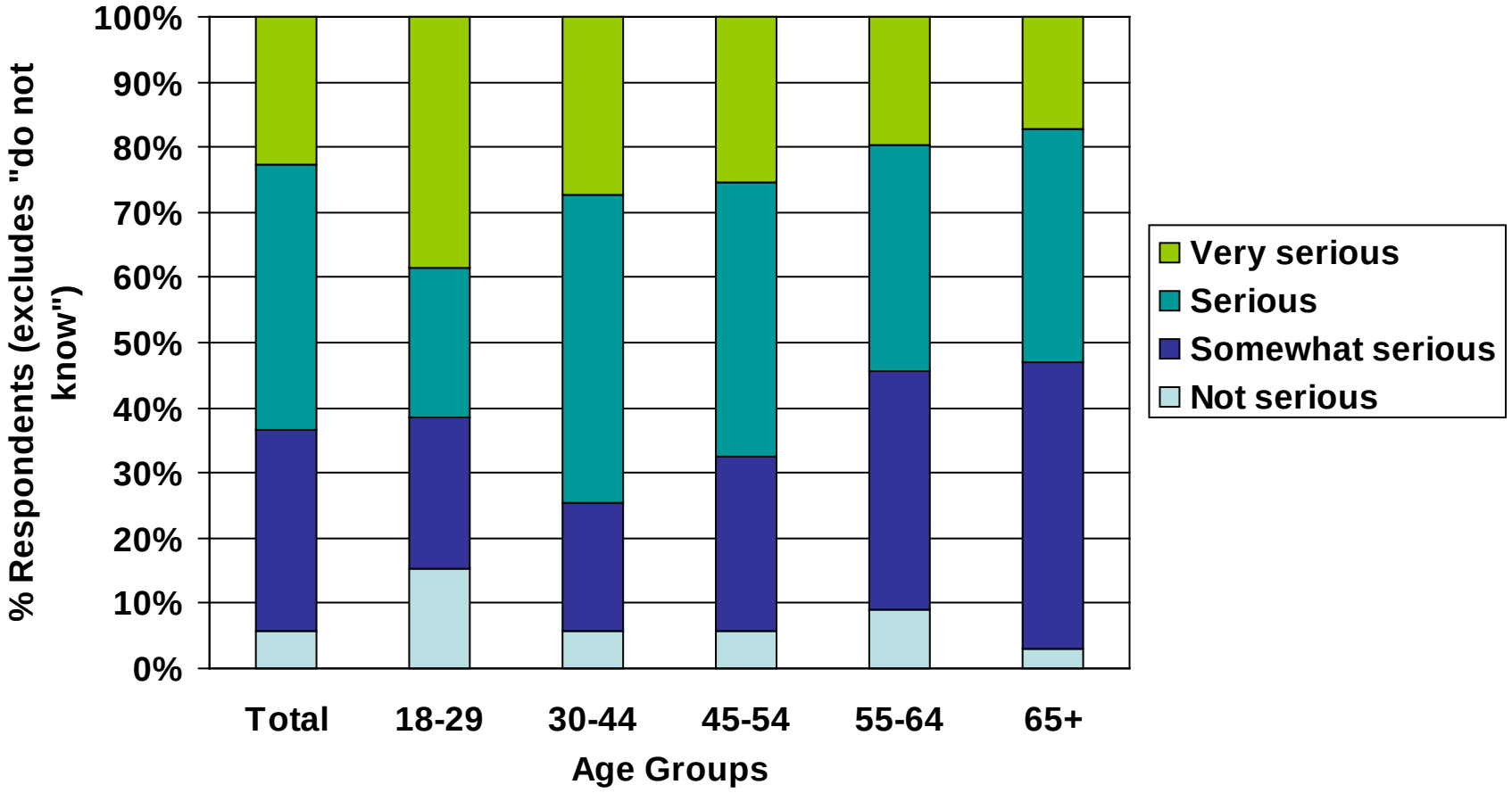
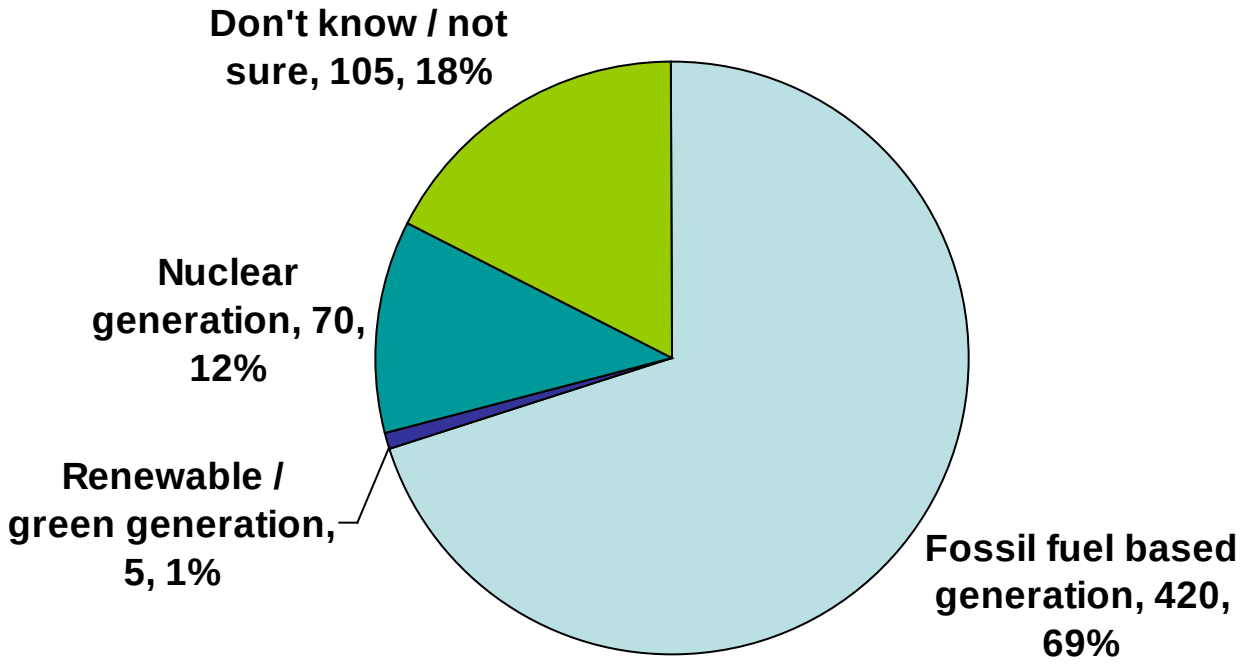
# Fifty-nine percent of respondents thought the climate change situation is serious or very serious.




**How would you describe the climate change situation?**

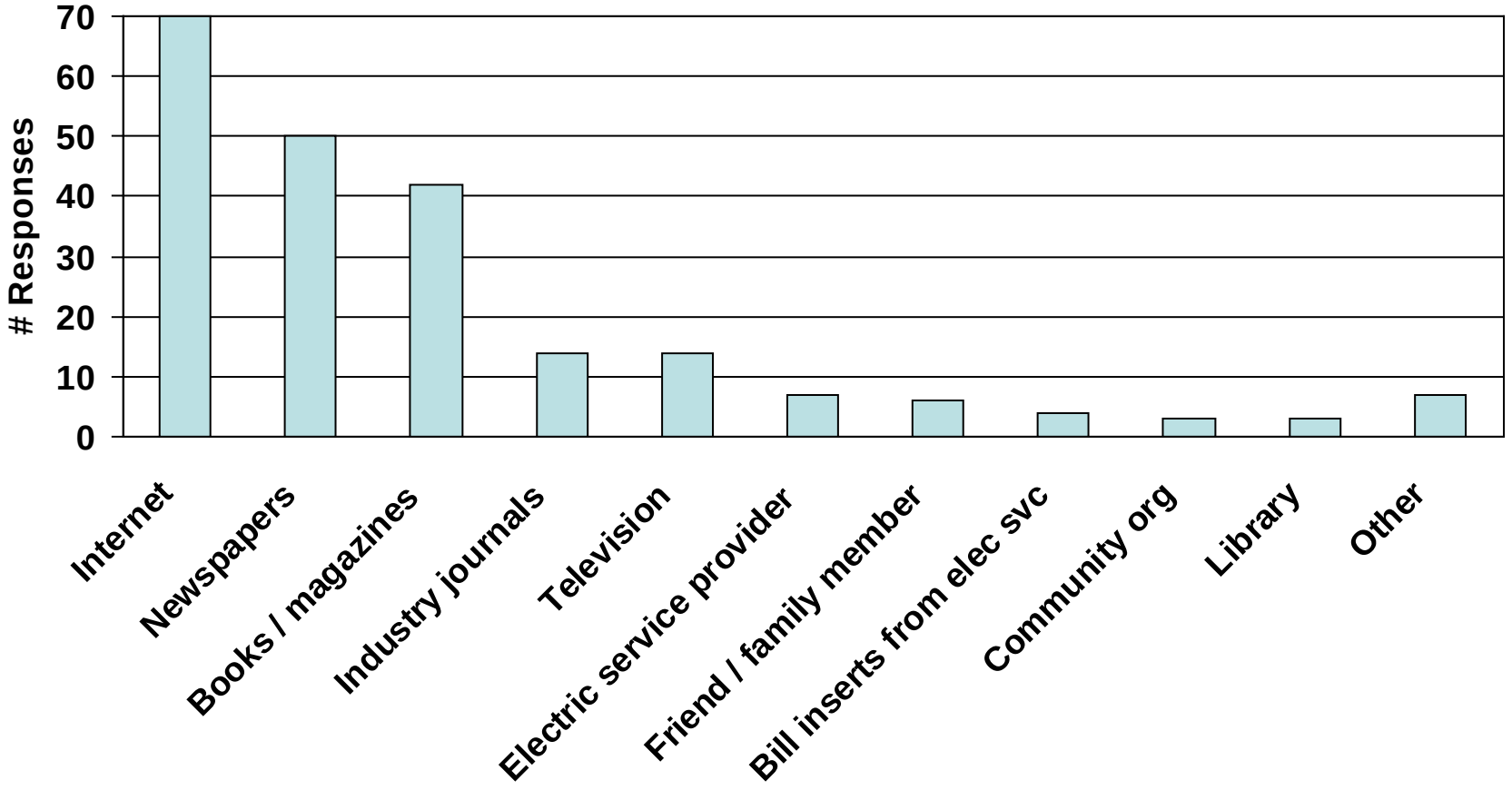
CERC start here
Connecticut Economic Resource Center, Inc.

# The majority thought that fossil fuels accounted for most of the electricity generated in Connecticut.




**Which of the following do you think accounts for most of the electricity generated in Connecticut? (600 Responses)**

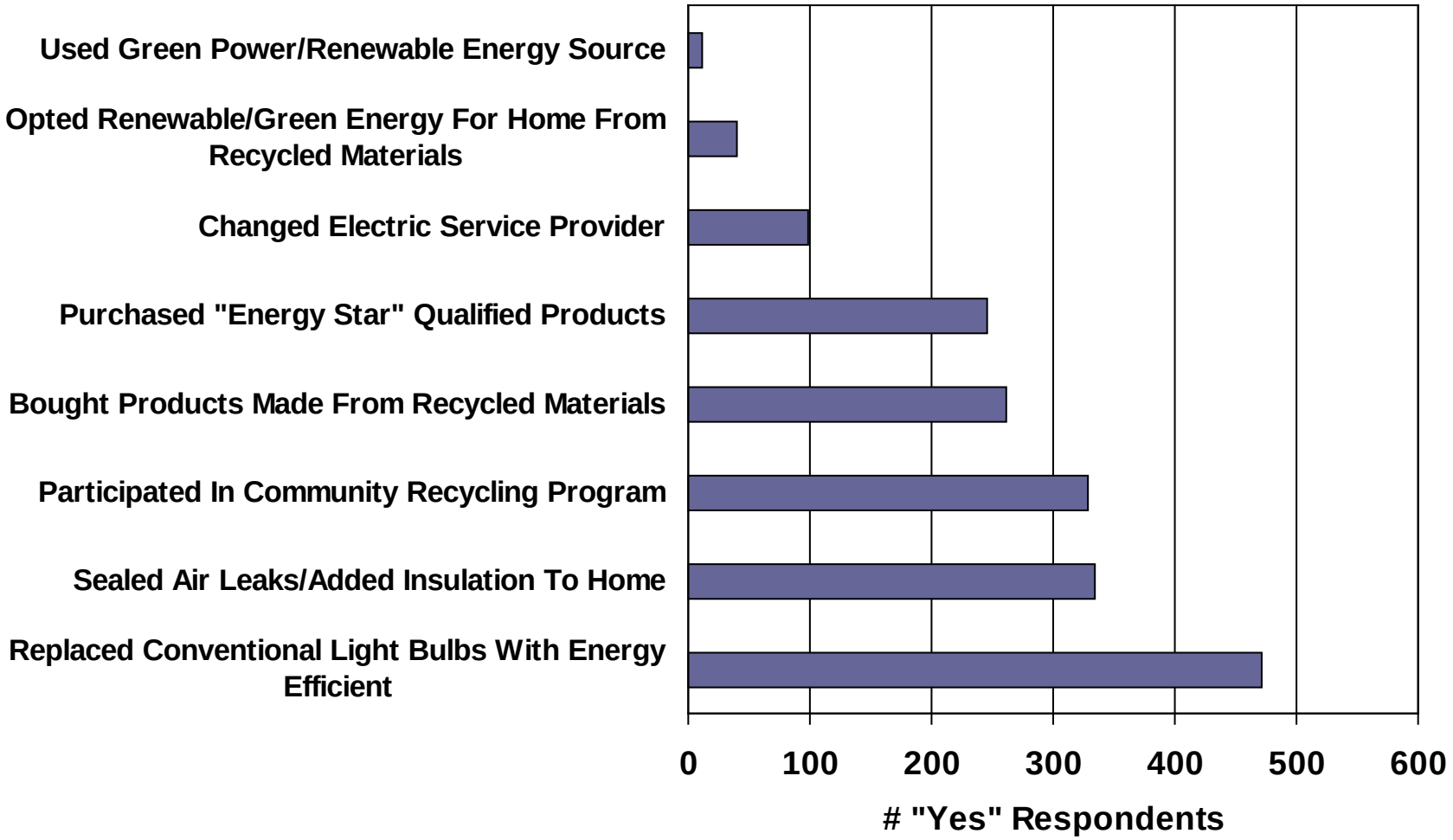
# The Internet, newspapers, books and magazines were the most popular sources for electric energy information.




**From what sources did you obtain your information about electric energy sources? (98 Respondents, 220 Responses)**

CERC start here
Connecticut Economic Resource Center, Inc.

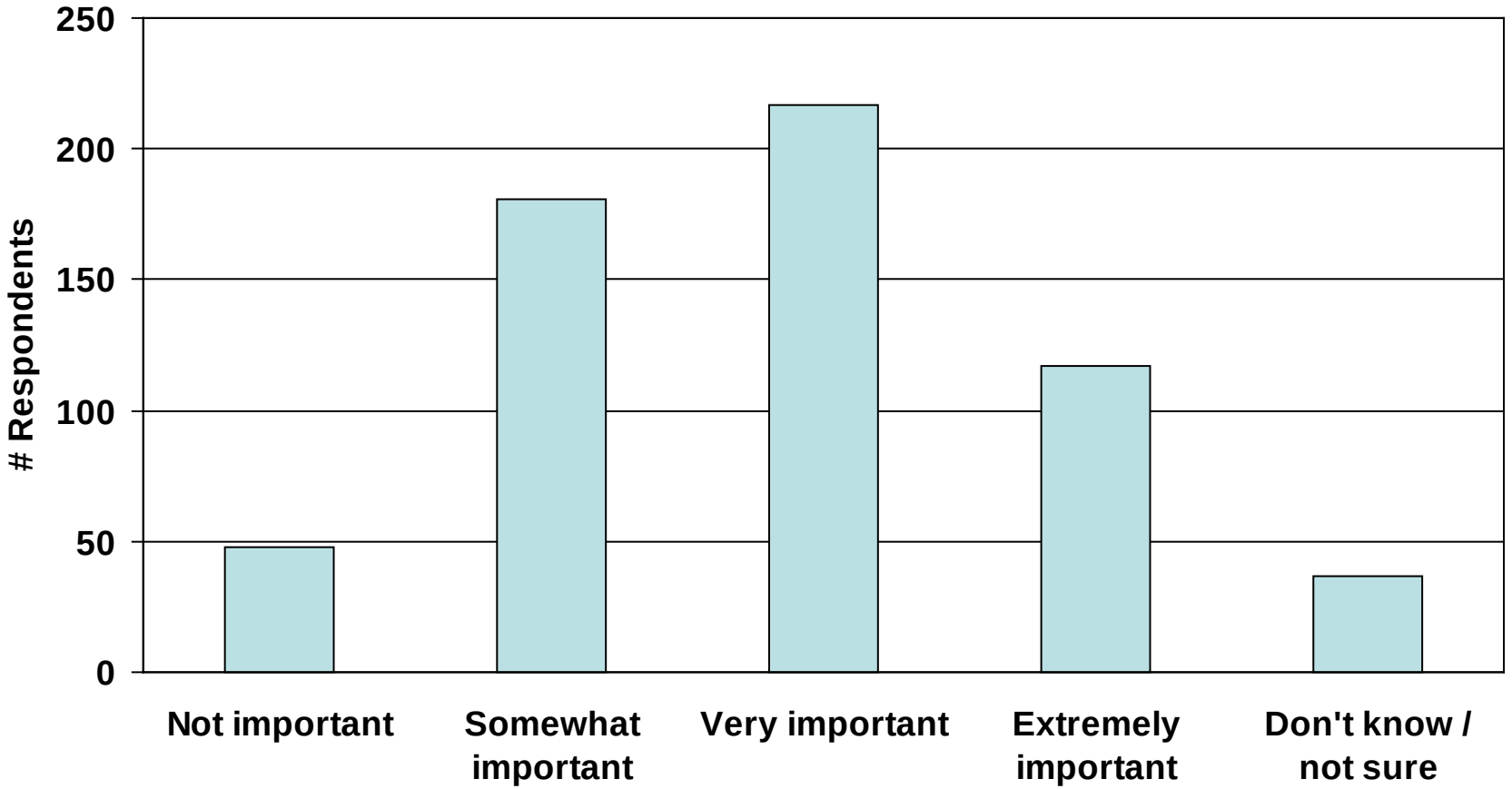
# Using energy efficient light bulbs was the most likely action taken by the respondents.




**Have you taken the following actions within the past 12 months?**

CERC start here
Connecticut Economic Resource Center, Inc.

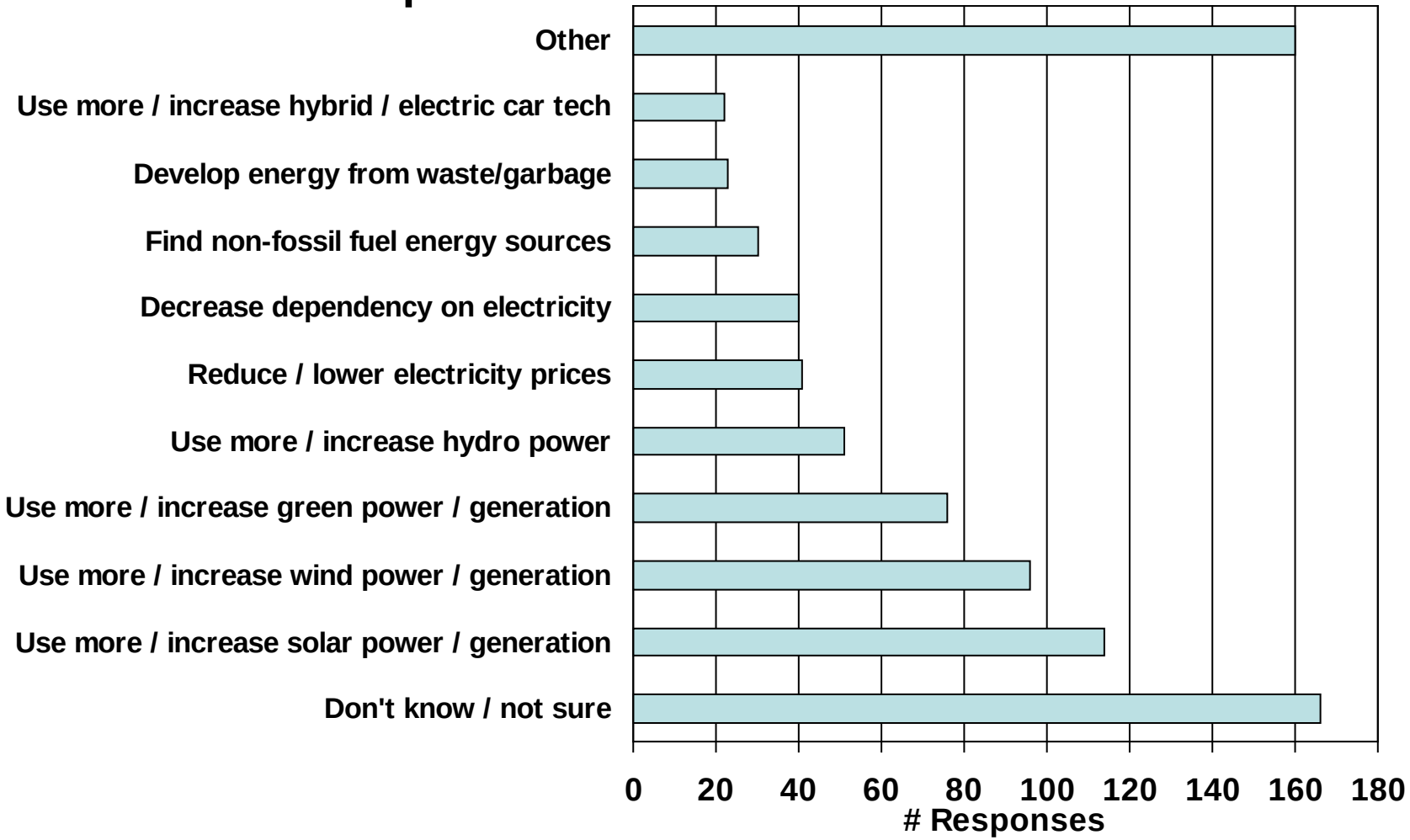
# It was very or extremely important that Connecticut reduce its reliance on fossil fuels to 334, or 56%, of respondents.




**How important is it to you that Connecticut reduces its reliance on fossil fueled power generation? (600 Respondents)**

CERC start here
Connecticut Economic Resource Center, Inc.

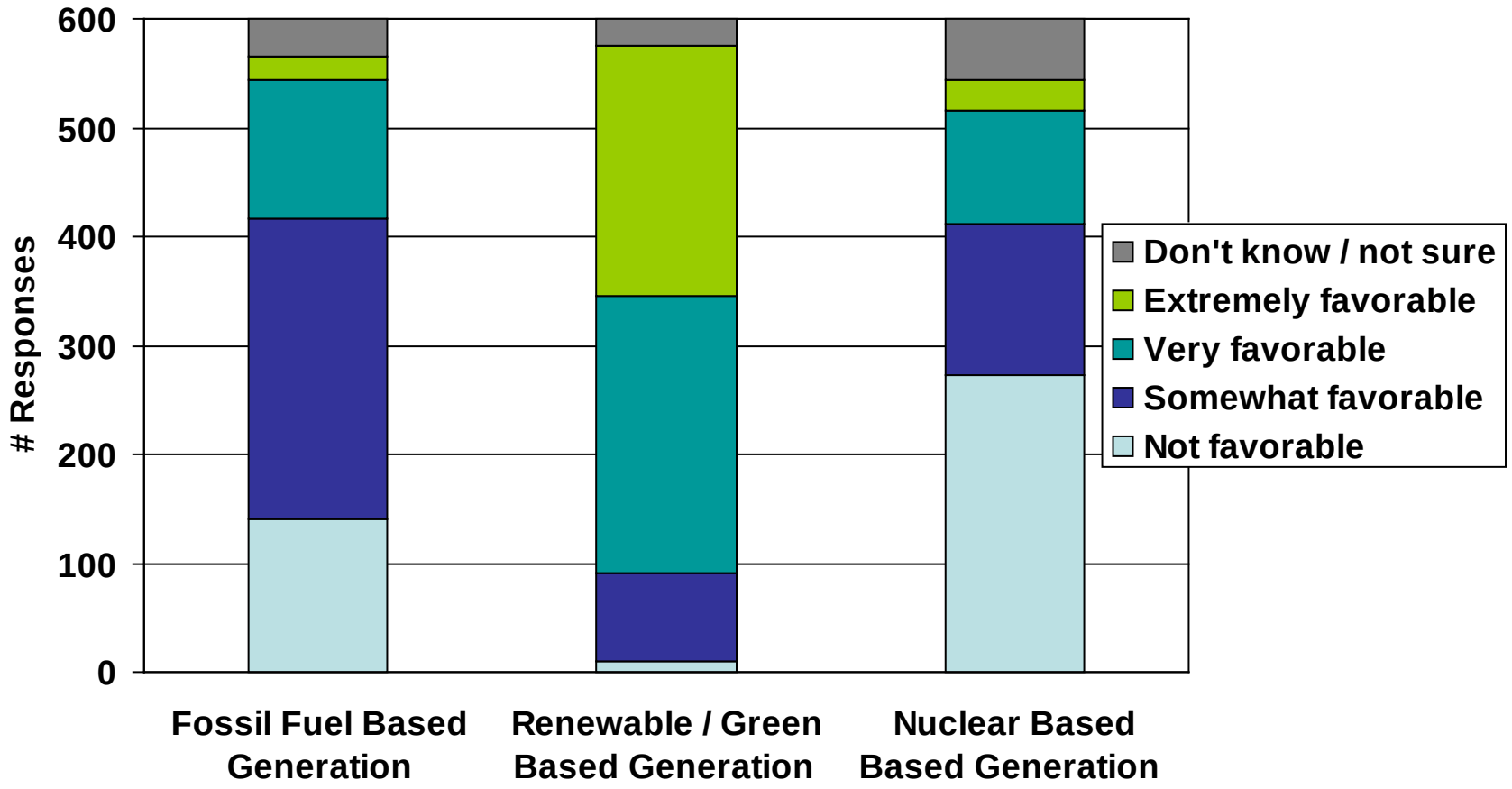
# Besides not knowing how to reduce Connecticut's reliance on fossil fuels, renewable powers were most often cited.




**What actions should be considered to reduce Connecticut's reliance on fossil fueled power generation? (515 Respondents, 819 Responses)**

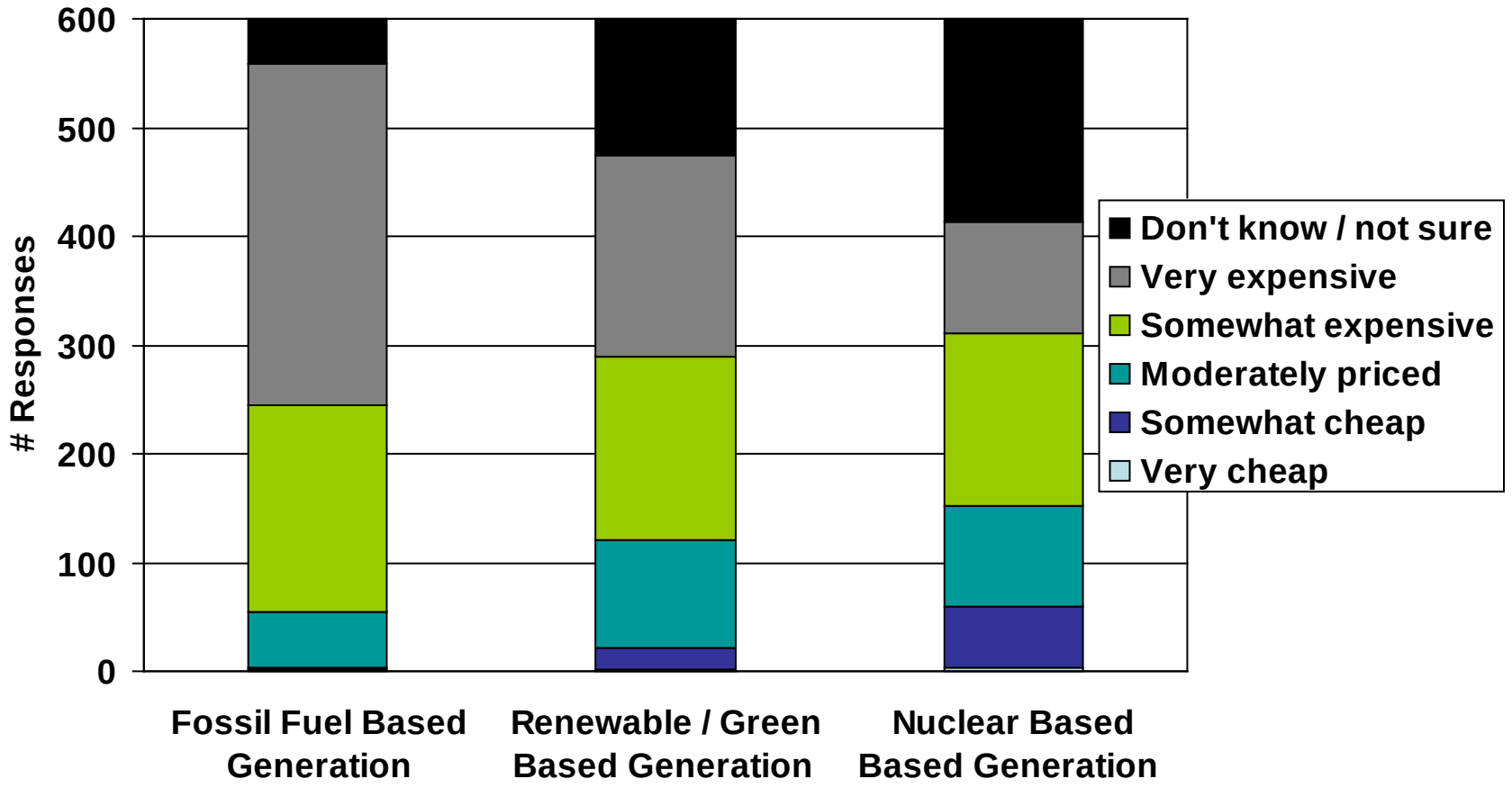
CERC start here
Connecticut Economic Resource Center, Inc.

# Renewable/green based generation was seen most favorably.

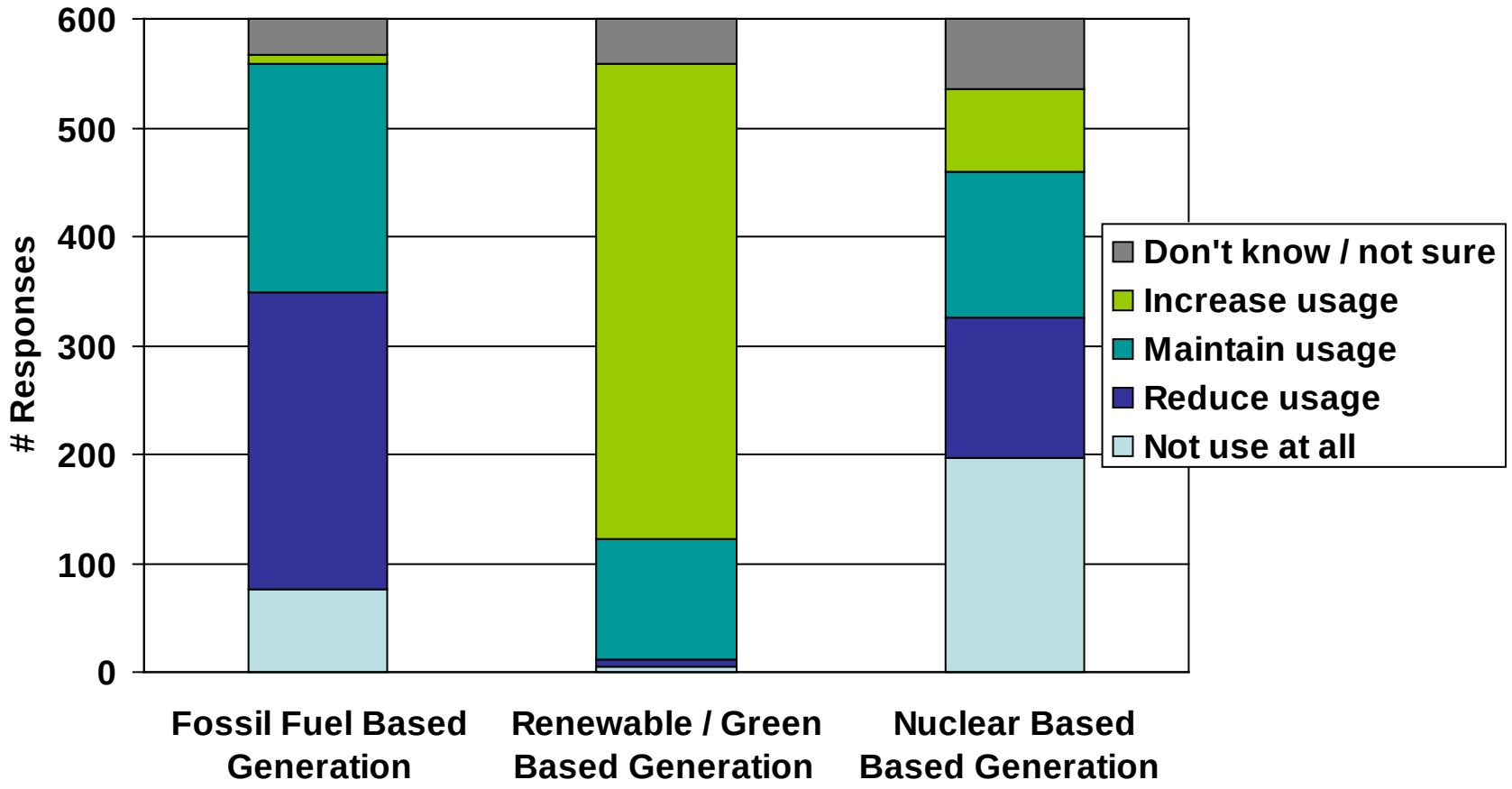



**How favorable or unfavorable is ___ in making a substantial contribution to reliable and secure supplies of power in the future?**

# Fossil fuels were seen as the most expensive, although one-third of respondents did not know how to rate the cost of nuclear based generation.



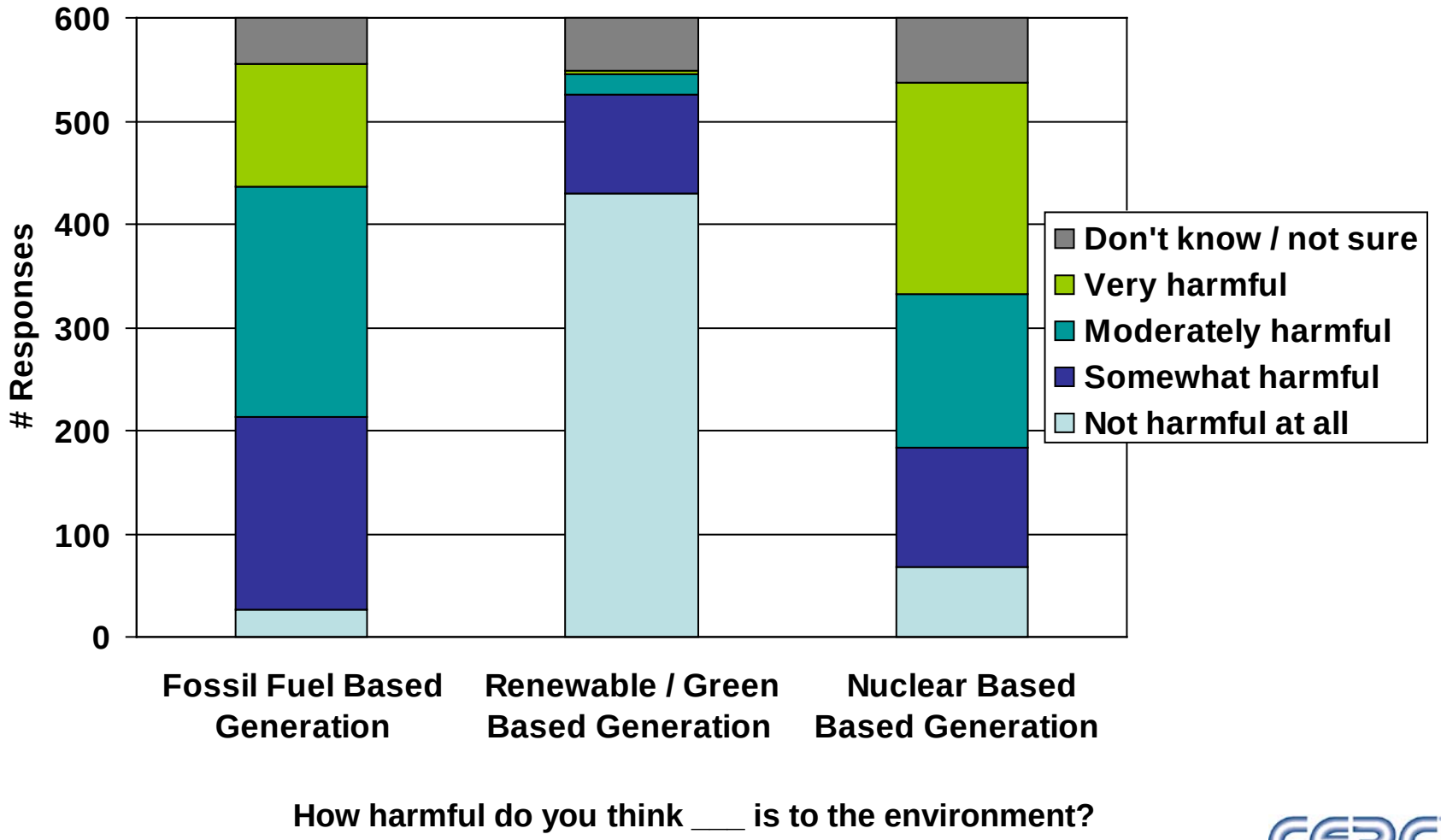
# Respondents wanted to increase usage of renewable/green based generation.



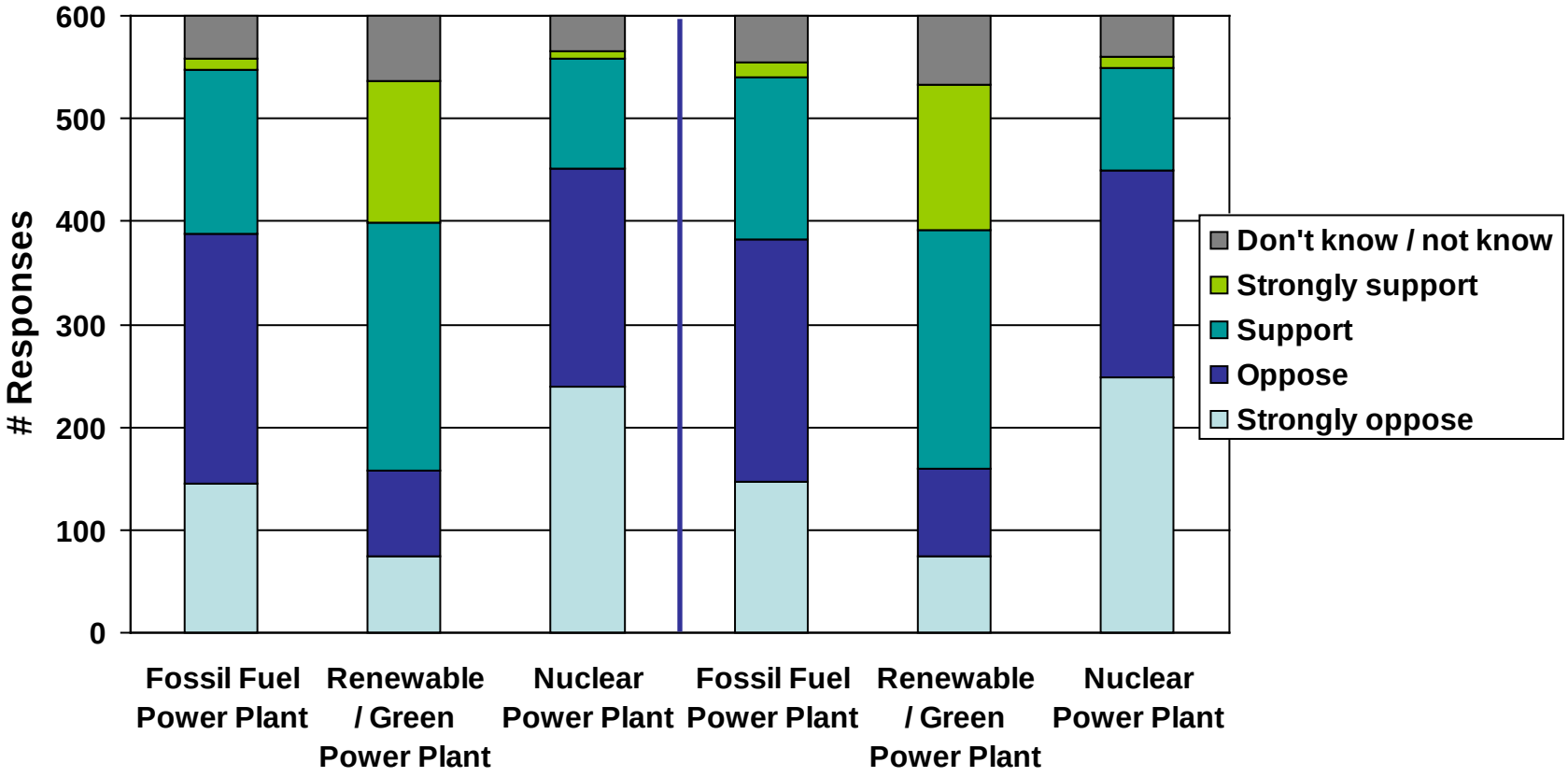

**Should Connecticut increase usage, maintain usage, reduce usage or not use ___ to meet its energy needs over the next 25 years?**

CERC start here
Connecticut Economic Resource Center, Inc.

# Renewable/green based generation was seen as the least harmful of the three options.



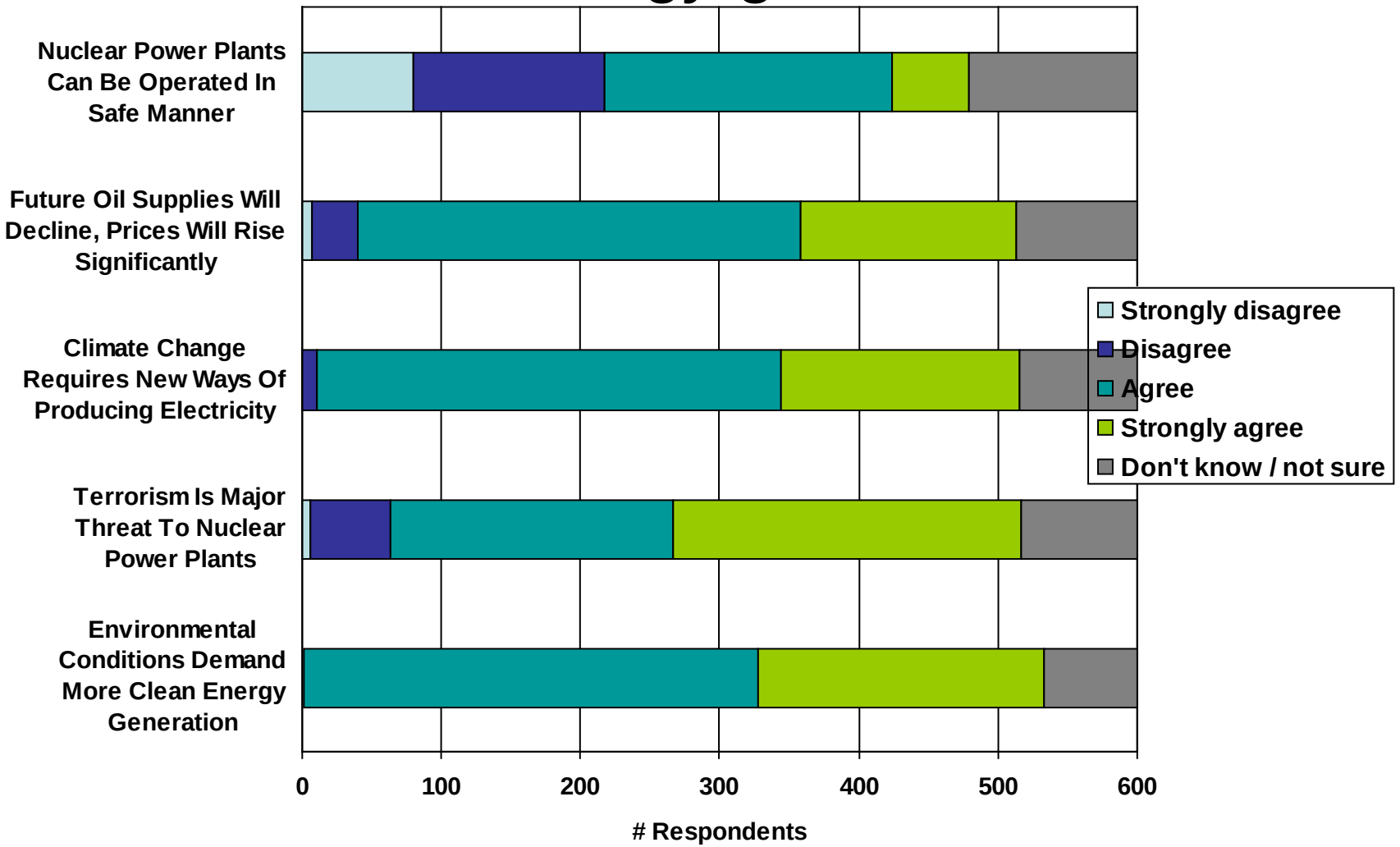
# Reducing property taxes did not change many respondents' minds about locating a power plant nearby.




**How do you feel about having a ___ built within 5 miles of your home? How do you feel about having a ___ built within 5 miles of your home if it would reduce your property taxes?**

CERC start here
Connecticut Economic Resource Center, Inc.

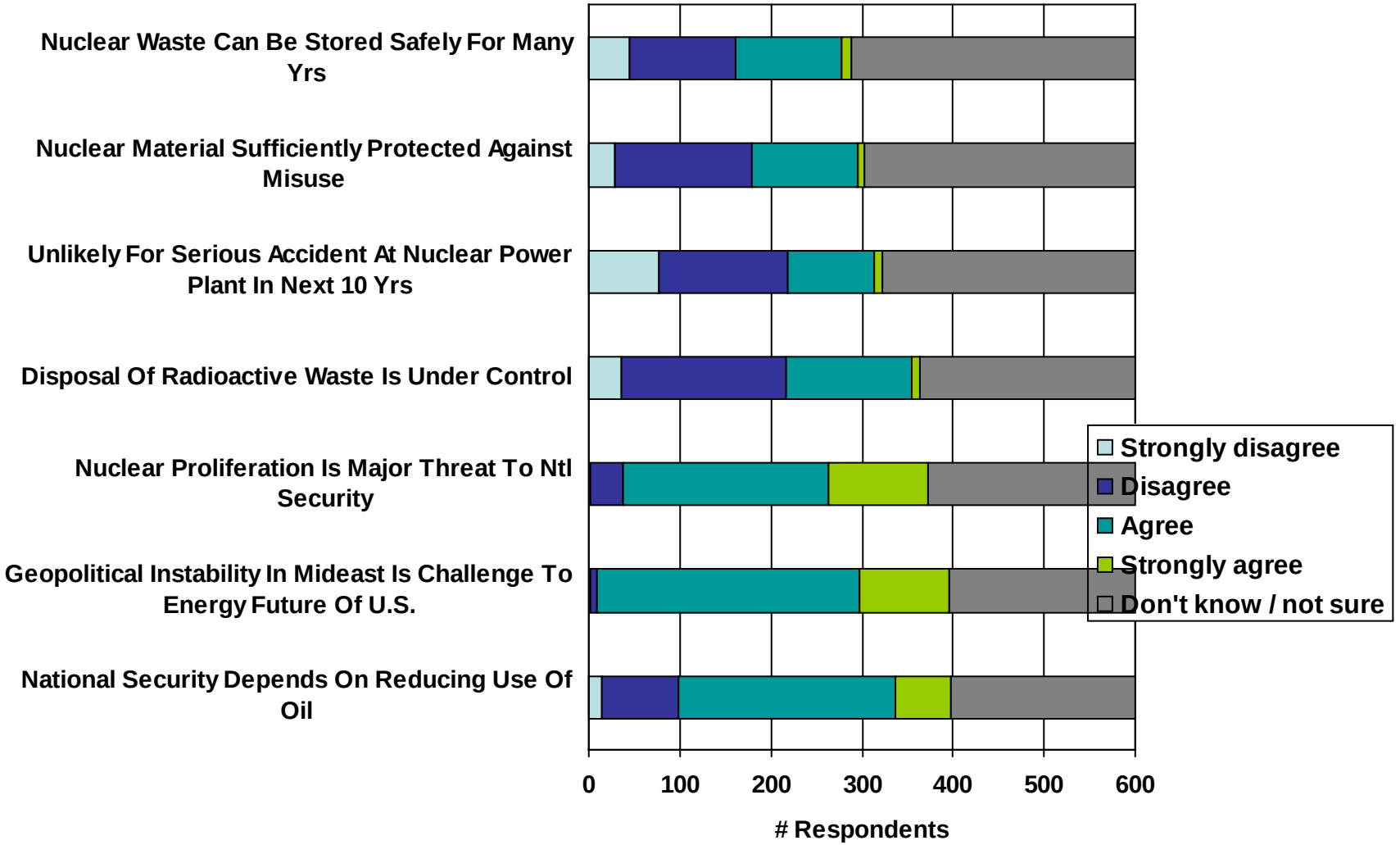
# Virtually everyone agreed that environmental conditions demand more clean energy generation.




**Based upon what you know or may have heard, please tell me if you agree or disagree with the following (1 of 2).**

CERC start here
Connecticut Economic Resource Center, Inc.

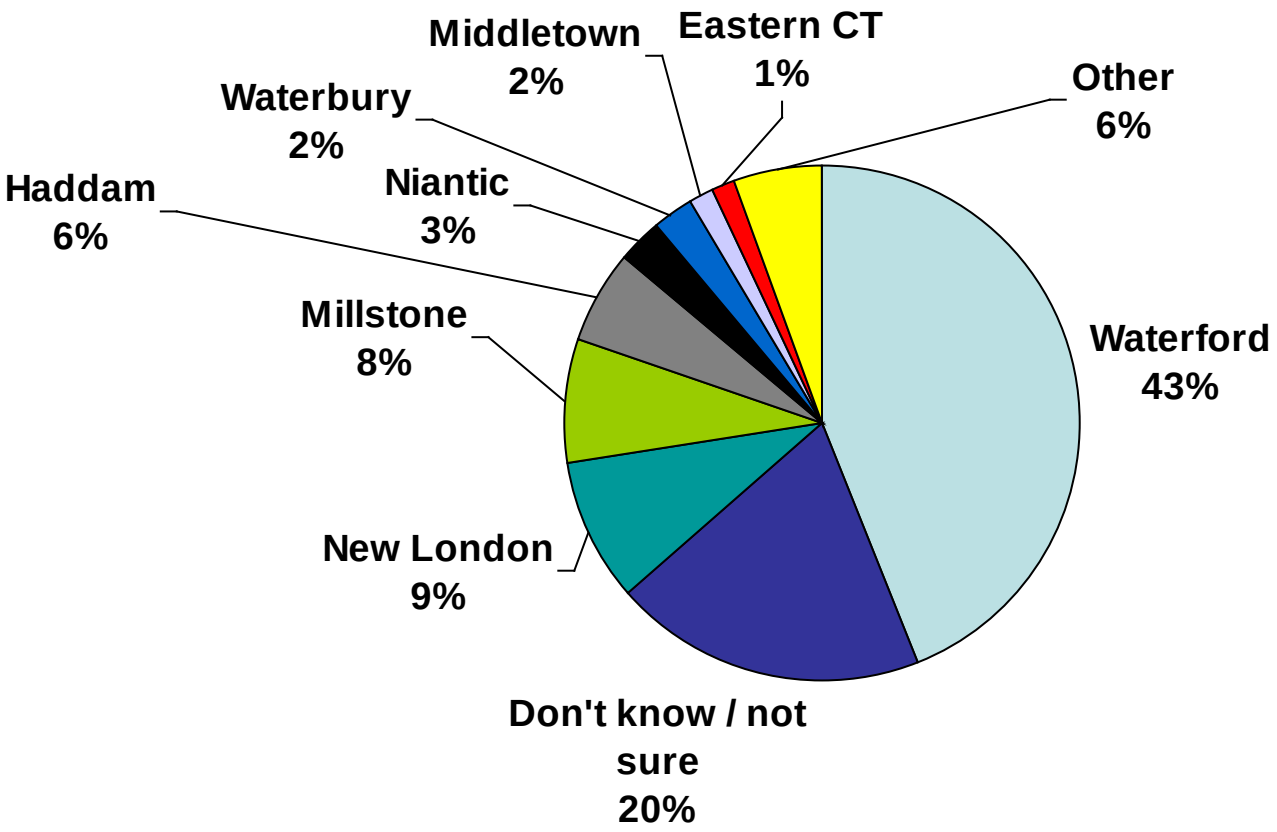
# Many respondents were unsure about nuclear issues.




**Based upon what you know or may have heard, please tell me if you agree or disagree with the following (2 of 2).**

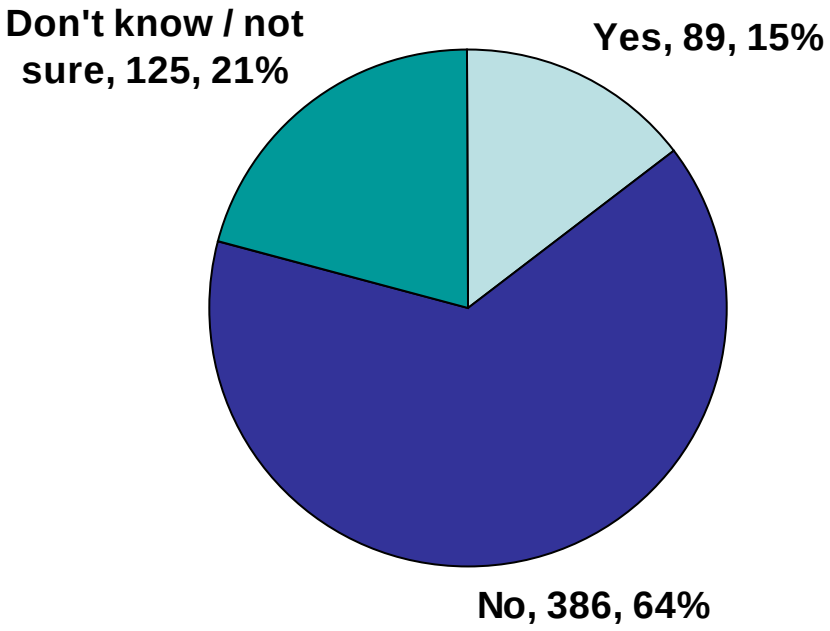
CERC start here
Connecticut Economic Resource Center, Inc.

# Waterford was the most often mentioned location for an operating nuclear power plant in the state.




**Where are the operating nuclear power plants located? (314 Respondents, 378 Responses)**

# Most respondents did not think that Connecticut should build a new nuclear power plant facility.




**As a result of the role you see nuclear power playing in the current national and international debate about climate change and the use of fossil fuels, do you think that Connecticut should build a new nuclear power plant facility for additional electric capacity? (600 Responses)**

# Key Findings

- Respondents favored green/renewable energies over fossil fuels and nuclear.
- Many respondents do not understand the activities at a nuclear power plant facility.
- Reducing property taxes was not seen as an incentive for locating a nuclear power plant facility.
- Building a new nuclear power plant facility was more favorable to those with graduate school experience and degrees.
- Explosions at Fukushima Daiichi Nuclear Power Plant would likely alter residents' opinions.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

December 8, 2011

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Nuclear Connecticut, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION, UNIT NOS. 2 AND 3 – REQUEST FOR ADDITIONAL INFORMATION REGARDING 60-DAY RESPONSE TO BULLETIN 2011-01, "MITIGATING STRATEGIES" (TAC NOS. ME6450 AND ME6451)

Dear Mr. Heacock:

On May 11, 2011, the U.S. Nuclear Regulatory Commission (NRC) issued Bulletin 2011-01, "Mitigating Strategies,"[1] to all holders of operating licenses for nuclear power reactors, except those that have permanently ceased operation and have certified that fuel has been removed from the reactor vessel. The purpose of the bulletin was to obtain a comprehensive verification that licensees' mitigating strategies to maintain or restore core cooling, spent fuel cooling, and containment following a large explosion or fire were compliant with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.54(hh)(2). The bulletin requested information on licensee 10 CFR 50.54(hh)(2) mitigating strategies in light of the recent events at Japan's Fukushima Daiichi facility to determine if (1) additional assessment of program implementation is needed, (2) the current inspection program should be enhanced, or (3) further regulatory action is warranted.

The bulletin required two sets of responses pursuant to the provisions of 10 CFR 50.54(f). The first set of responses was due 30 days after issuance of the bulletin (June 10, 2011). By letter dated June 9, 2011,[2] you provided the 30-day response to the bulletin for Millstone Power Station, Unit Nos. 2 and 3 (MPS2 and MPS3, respectively). The second set of responses was due 60 days after issuance of the bulletin (July 11, 2011). By letter dated July 8, 2011,[3] you provided the 60-day response to the bulletin for MPS2 and MPS3.

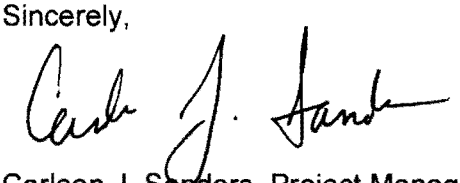
The NRC staff has reviewed the submitted information and determined that it needs additional information regarding your 60-day response to the bulletin. Please respond to the enclosed request for additional information within 30 days of the date of this letter.

---

[1] Agencywide Documents Access and Management System (ADAMS) Accession No. ML111250360
[2] ADAMS Accession No. ML11172A189
[3] ADAMS Accession No. ML11193A266

If you have any questions, please contact me at (301) 415-1603.

Sincerely,



Carleen J. Sanders, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-336 and 50-423

Enclosure:
Request for Additional Information

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REQUEST FOR ADDITIONAL INFORMATION

RESPONSE TO BULLETIN 2011-01

MILLSTONE POWER STATION, UNIT NOS. 2 AND 3

DOCKET NOS. 50-336 AND 50-423

On May 11, 2011, the U.S. Nuclear Regulatory Commission (NRC) issued Bulletin 2011-01, "Mitigating Strategies,"[1] to all holders of operating licenses for nuclear power reactors, except those that have permanently ceased operation and have certified that fuel has been removed from the reactor vessel.

The bulletin required two sets of responses pursuant to the provisions of Title 10 of the *Code of Federal Regulations* Section 50.54(f). The first set of responses was due 30 days after issuance of the bulletin (June 10, 2011). By letter dated June 9, 2011,[2] you provided the 30-day response to the bulletin for Millstone Power Station, Unit Nos. 2 and 3 (MPS2 and MPS3, respectively). The second set of responses was due 60 days after issuance of the bulletin (July 11, 2011). By letter dated July 8, 2011,[3] you provided the 60-day response to the bulletin for MPS2 and MPS3.

The NRC staff has reviewed the submitted information and determined that it needs additional information regarding your 60-day response to the bulletin.

1. Describe in detail how you ensure there is sufficient fuel for the pumping source when needed.

   The bulletin requested that each licensee describe in detail the maintenance of equipment supporting the mitigating strategies to ensure that it will be functional when needed. The NRC staff could not determine if you performed activities to ensure that sufficient fuel would be available for the pumping source so that it will be functional when needed.

2. Clarify how you initially verified the feasibility of using portable sprays to mitigate a release coming from a damaged or failed containment.

   The bulletin requested that each licensee describe in detail the testing of equipment supporting the mitigating strategies, including testing accomplished to ensure the strategies were initially feasible. In response to the bulletin, you list strategy A.4-7 which typically refers to the use of portable sprays to mitigate a release coming from a damaged or failed containment. However, the description of how you ensured the feasibility of strategy A.4-7 appears to be a verification of the strategy for the spent fuel pool spray strategy (A.2-3).

---

[1] Agencywide Documents Access and Management System (ADAMS) Accession No. ML111250360
[2] ADAMS Accession No. ML11172A189
[3] ADAMS Accession No. ML11193A266

If you have any questions, please contact me at (301) 415-1603.

Sincerely,

*/ra/*

Carleen J. Sanders, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-336 and 50-423

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Request for Additional Information

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~~OFFICIAL USE ONLY – SECURITY-RELATED INFORMATION~~

December 22, 2011

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Resources
5000 Dominion Blvd.
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION – NRC SECURITY BASELINE INSPECTION REPORT 05000336/2011405 AND 05000423/2011405

Dear Mr. Heacock:

On December 1, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed a security baseline inspection at your Millstone Power Station. The inspection covered one or more of the key attributes of the security cornerstone of the NRC's Reactor Oversight Process. The enclosed inspection report documents the inspection results, which were discussed on December 1, 2011, with Mr. Jeff Semancik, Plant Manager, and other members of your staff.

The inspection examined activities conducted under your licenses as they relate to security and compliance with the Commission's rules and regulations and with the conditions of your licenses. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

No NRC-identified or self-revealing findings were identified during this inspection.

However, licensee-identified violations, which were determined to be of very low security significance, are listed in this report. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest any NCV in the enclosed report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Millstone Power Station.

Enclosure contains Sensitive Unclassified Non-Safeguards Information. When separated from enclosure, this transmittal document is decontrolled.

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In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's Agencywide Documents Access and Management System, (ADAMS). ADAMS is accessible from the NRC Website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

However, the material enclosed herewith contains Security-Related Information in accordance with 10 CFR 2.390(d)(1) and its disclosure to unauthorized individuals could present a security vulnerability. Therefore, the material in the enclosure will not be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. If Security-Related Information is necessary to provide an acceptable response, please mark your entire response Security-Related Information in accordance with 10 CFR 2.390(d)(1) and follow the instructions for withholding in 10 CFR 2.390(b)(1). In accordance with 10 CFR 2.390(b)(1)(ii), the NRC is waiving the affidavit requirements for your response.

Sincerely,

*/RA/*

James M. Trapp, Chief
Plant Support Branch 1
Division of Reactor Safety

Docket Nos.: 50-336, 50-423
License Nos.: DPR-65, NPF-49

Enclosure:
Inspection Report 05000336/2011405 and 05000423/2011405
w/Attachment: Supplemental Information Official Use Only Security Related Information (OUO-SRI)

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In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's Agencywide Documents Access and Management System, (ADAMS). ADAMS is accessible from the NRC Website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

However, the material enclosed herewith contains Security-Related Information in accordance with 10 CFR 2.390(d)(1) and its disclosure to unauthorized individuals could present a security vulnerability. Therefore, the material in the enclosure will not be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. If Security-Related Information is necessary to provide an acceptable response, please mark your entire response Security-Related Information in accordance with 10 CFR 2.390(d)(1) and follow the instructions for withholding in 10 CFR 2.390(b)(1). In accordance with 10 CFR 2.390(b)(1)(ii), the NRC is waiving the affidavit requirements for your response.

Sincerely,

*/RA/*

James M. Trapp, Chief
Plant Support Branch 1
Division of Reactor Safety

Docket Nos.: 50-336, 50-423
License Nos.: DPR-65, NPF-49

Enclosure:
Inspection Report 05000336/2011405 and 05000423/2011405
w/Attachment: Supplemental Information Official Use Only Security Related Information (OUO-SRI)

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| DATE | 12/8/11 | | 12/19/11 | | 12/21/11 | | 12/22/11 | | | |

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E. Wilds, Jr., Ph.D., Director, State of Connecticut SLO
J. Sherry, Director, Office of Counterterrorism, NY State Office of Homeland Security
F. Murray, President & CEO, NY State Energy Research and Development Authority

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

December 28, 2011

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Nuclear Connecticut, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION, UNIT NOS. 2 AND 3 - AUDIT OF THE LICENSEE'S MANAGEMENT OF REGULATORY COMMITMENTS (TAC NOS. ME7222 AND ME7223)

Dear Mr. Christian:

The U.S. Nuclear Regulatory Commission (NRC) informed licensees in Regulatory Issue Summary (RIS) 2000-17, "Managing Regulatory Commitments Made by Power Reactor Licensees to the NRC Staff," dated September 21, 2000, that the Nuclear Energy Institute document NEI 99-04, "Guidelines for Managing NRC Commitment Changes," contains acceptable guidance for controlling regulatory commitments. RIS 2000-17 encouraged licensees to use the NEI guidance or similar administrative controls to ensure that regulatory commitments are implemented and that changes to the regulatory commitments are evaluated and, when appropriate, reported to the NRC.

The NRC Office of Nuclear Reactor Regulation (NRR) has instructed its staff to perform a periodic audit of licensees' commitment management programs to determine whether the licensees' programs are consistent with the industry guidance in NEI 99-04, and that regulatory commitments are being effectively implemented. The previous audit of the Dominion Nuclear Connecticut, Inc. (licensee) commitment management program was performed at the Millstone Power Station (MPS), Unit Nos. 2 and 3 in Waterford, Connecticut on May 20, 2008.[1] The subsequent audit was performed at the site on November 15 and November 16, 2011.

As discussed in the enclosed audit report, the NRC staff concludes that the licensee's procedure used to manage commitments provides the necessary attributes for an effective commitment management program. However, although the procedure itself is adequate, there have been numerous problems with adherence to the procedure. As such, the licensee's commitment management program has not been effective with respect to: tracking regulatory commitments; reporting to the NRC; and managing changes to commitments. The licensee is addressing deficiencies in tracking regulatory commitments and reporting to the NRC through the corrective action process. At the time of this audit, deficiencies in managing changes to commitments had not been addressed.

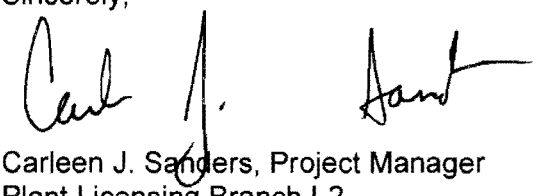
The NRR staff has discussed the results of the audit with NRC Region I staff. Further follow-up on the issues discussed in the audit report may be considered as part of the reactor oversight

[1] Agencywide Documents Access and Management Systems (ADAMS) Accession No. ML082400045

baseline inspections. The NRR staff has also discussed the results of the audit with the licensee staff.

The NRC staff appreciates the resources that were made available by Millstone Station staff during the audit. If you have any questions, please contact me at (301) 415-1603.

Sincerely,



Carleen J. Sanders, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-336 and 50-423

Enclosure:
Audit Report

cc w/encl: Distribution via Listserv

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

# AUDIT REPORT BY THE OFFICE OF NUCLEAR REACTOR REGULATION

# LICENSEE MANAGEMENT OF REGULATORY COMMITMENTS

# MILLSTONE POWER STATION, UNIT NOS. 2 AND 3

# DOCKET NOS. 50-336 AND 50-423

## 1.0 INTRODUCTION AND BACKGROUND

The U.S. Nuclear Regulatory Commission (NRC) informed licensees in Regulatory Issue Summary (RIS) 2000-17, "Managing Regulatory Commitments Made by Power Reactor Licensees to the NRC Staff," dated September 21, 2000, that the Nuclear Energy Institute document NEI 99-04, "Guidelines for Managing NRC Commitment Changes," contains acceptable guidance for controlling regulatory commitments. RIS 2000-17 encouraged licensees to use the NEI guidance or similar administrative controls to ensure that regulatory commitments are implemented and that changes to the regulatory commitments are evaluated and, when appropriate, reported to the NRC.

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NEI-99-04 defines a 'regulatory commitment' as an explicit statement to take a specific action agreed to, or volunteered by, a licensee and submitted in writing on the docket to the NRC. NRR guidelines direct the NRR Project Manager to perform a periodic audit of the licensee's commitment management program by assessing the adequacy of the licensee's implementation of a sample of commitments made to the NRC in past licensing actions (amendments, reliefs, exemptions, etc.) and activities (bulletins, generic letters, etc.).

## 2.0 AUDIT PROCEDURE AND RESULTS

An audit was performed at MPS on November 15 and 16, 2011. The audit reviewed commitments made since the previous audit which was conducted May 20, 2008. The audit consisted of two parts: (1) verification of the licensee's implementation of NRC commitments that have been completed; and (2) verification of the licensee's program for managing changes to NRC commitments.

[1] Agencywide Documents Access and Management Systems (ADAMS) Accession No. ML082400045.

## 2.1 Verification of Licensee's Implementation of NRC Commitments

The primary focus of this part of the audit is to confirm that the licensee has implemented those commitments made to the NRC as part of past licensing actions/activities. For commitments not yet implemented, the NRC staff determines whether they have been captured in an effective program for future implementation.

### 2.1.1 Audit Scope

Before the audit, the NRC staff searched ADAMS for the licensee's licensing actions and licensing activity submittals dated since the previous audit. The NRC staff requested that the licensee provide a list of current open and closed regulatory commitments. From these lists, the NRC staff chose a sample of items to ensure that the items had been captured in an effective program for implementation. Criteria from the NRC staff's guidance documents were used to select a sample of regulatory commitments to review. All of the commitments DNC made to the NRC during the audited time frame were reviewed, however the area of focus and the level of detail of the review varied. The commitments selected for review from inception to closure (or current status) are shown in Table 1 entitled, "Selected Audited Commitments."

### 2.1.2 Commitment Tracking Database Program

The licensee's commitments are tracked in a computer database named the Commitment Tracking System (CTS). CTS is defined as "a repository for information associated with specific commitments and actions taken to implement each commitment."

DNC's Administrative Procedure number LI-AA-110, Revision 0, "Commitment Management," describes the licensee's regulatory commitment management process. The procedure defines who on DNC's staff has the authority to make commitments to the NRC.

Once commitments are identified, items are entered into the CTS. Following identification, the licensee enters committed due dates (i.e., those committed in formal documentation) or establishes a due date, as appropriate. These items are then assigned to the appropriate functional area manager for implementation. The CTS maintains a record of the required action(s), responsible party, status, due dates, and comments.

The NRC staff found that CTS: (1) is capable of tracking commitments; and (2) provides an adequate method of linking together a summary of the issue, action type, the lead department, the responsible individual, due date, and extensions when used in accordance with the procedure. The NRC staff identified 7 commitments not captured in the CTS. The licensee has entered this into their corrective action program as CR452814. DNC confirmed that these 7 commitments have been closed. Several of these commitments were selected for review from inception to closure (or current status) and are captured in Table 1.

**Table 1 – Selected Audited Commitments**

| Commitment Tracking Number | Dominion Nuclear Connecticut Inc. Submittal Date | Commitment Summary/Description | Licensee Implementation Status |
|---|---|---|---|
| Commitment not captured in the CTS | 03/05/2009 | Spent fuel pool criticality responses to a request for additional information | Closed |
| RCR-42995<br>RCR-42996<br>RCR-42997 | 11/23/2009 | Steam Generator (SG) Interim Alternate Repair Criteria (IARC) for MPS3 commitments | Closed |
| RCR-42998 | 04/26/2010 | Remove seven MPS3 SG tubes from service | Working |
| RCR-43000 | 12/06/2010 | Response to a Notice of Violation: Identify resolution of operator manual actions | Closed |
| 2 commitments not captured in the CTS | 08/19/2011 | Temporary relief request for leak on the SW system | Closed |

2.1.3 Audit Results

The NRC staff reviewed reports generated by the tracking programs and closure documentation to evaluate the status of commitments as reported in the CTS. The NRC staff confirmed that the commitments selected for the sample had been appropriately implemented in station procedures, design change programs and other station administrative processes as appropriate.

2.2 Verification of the Licensee's Program for Managing NRC Commitment Changes

2.2.1 Audit Scope

The primary focus of this part of the audit is to verify that the licensee has established administrative controls for modifying or deleting commitments made to the NRC. The NRC staff compared the licensee's process for controlling regulatory commitments to the guidelines in NEI-99-04, which the NRC has found to be an acceptable guide for licensees to follow for managing and changing commitments. The process used at MPS is contained in LI-AA-110. The audit also verifies that the licensee's commitment management system includes a mechanism to ensure traceability of commitments following initial implementation. This ensures that licensee personnel are able to recognize that future proposed changes to the affected design features or operating practices require evaluation in accordance with the commitment change control process. By letter dated June 30, 2010,[2] DNC informed the NRC that changes had been made to 11 commitments during calendar year 2009. These changes were included

[2] ADAMS Accession No. ML101940335

in the audit scope. These commitments are shown in Table 2, "Audited Commitment Changes from 2010 Letter."

The NRC staff reviewed the licensee's commitment change process to: (1) evaluate the licensee's methodology for proposed changes to regulatory commitments with particular consideration given to the intent of the original commitment and the safety and regulatory significance of the proposed change; and (2) evaluate the licensee's method of communicating commitment changes to the NRC when reports are warranted due to either safety or regulatory considerations. The NRC staff also evaluated the licensee's administrative controls for maintaining commitment "traceability" (e.g., markings or notations within procedures) to ensure that licensee personnel are able to recognize that future changes to the affected design features or operating practices require evaluation of the proposed change in accordance with the commitment change control process.

**Table 2 – Audited Commitment Changes from 2010 Letter**

| Commitment Tracking Number | Dominion Nuclear Connecticut Inc. Submittal Date | Commitment Summary/Description | Licensee Implementation Status |
|---|---|---|---|
| RCR-42920 | 11/05/2004 | Exemption from 10 CFR 50.68(b)(1) commitments | Closed |
| RCR-42921 | | | |
| RCR-42922 | | | |
| RCR-42923 | | | |
| RCR-42924 | | | |
| RCR-42925 | | | |
| RCR-42931 | 01/25/2005 | Exemption from 10 CFR 50.68(b)(1) request for additional information response commitments | Closed |
| RCR-42932 | | | |
| RCR-42933 | | | |
| RCR-42934 | | | |
| RCR-42935 | | | |

2.2.2 Audit Results

The NRC staff reviewed the licensee's procedure LI-AA-110 against NEI 99-04. In particular, Section 5.4 of the procedure lists NEI 99-04 as a source reference. In general, the NRC staff found that LI-AA-110 follows closely the guidance of NEI 99-04, as it sets forth the need for identifying, tracking and reporting commitments, and it provides a mechanism for changing commitments. Attachment 2 of LI-AA-110 provides detailed instructions regarding making changes to a commitment.

LI-AA-110 provides instructions for modification, revision or deletion of a regulatory commitment. A Regulatory Commitment Change Evaluation form is used to perform an applicability determination for any proposed commitment change. This evaluation process will determine if the proposed commitment change is covered by another codified process (e.g., 10 CFR 50.59, "Changes, tests and experiments," or 10 CFR 50.54, "Conditions of licenses"). Once commitment changes are identified, a Regulatory Commitment Change

Evaluation form is completed and reviewed. NRC notification is provided as necessary, as determined by the commitment change evaluation process.

For changes that do not require immediate NRC notification, notification is to be made annually in the Annual Summary Report. CTS items tracking the commitment are then updated, as appropriate, to document the regulatory commitment change. The NRC staff noted that no Annual Summary Report was provided for 2010. The licensee has entered this into their corrective action program as CR452855. The licensee determined that none of the changes made in 2010 met the threshold for reporting to the NRC. NRC staff also reviewed the changes made during 2010 as part of this audit and agreed that none of the changes made in 2010 met the threshold for reporting to the NRC.

The NRC staff concludes that the procedure used by the licensee to manage commitments is appropriate.

The NRC staff reviewed the 11 commitment changes. The licensee followed LI-AA-110 and completed the associated commitment change form. The 11 commitments were originally made to the NRC as part of an exemption request. Upon granting the exemption, the NRC staff's statements in the exemption elevated 10 of the 11 commitments to limitation/conditions of the exemption.[3] Limitations or conditions of an exemption are obligations, not commitments. Procedure LI-AA-110 defines an obligation as "[a]ny condition or action that is a legally binding requirement imposed through rule, regulation, Order, and NRC approved relief or alternative from regulation or ASME Code, an exemption from a regulation or Order, Technical Specification, or license condition." NEI 99-04 contains similar language. Therefore, the 10 limitations/conditions contained in the NRC exemption should not have been altered using the commitment change process. This was initially brought to DNC's attention during a review of the commitment change Annual Summary Report in June 2011. DNC has taken no action, as of the time of the commitment audit, to correct this issue. The NRR PM has provided this information to the NRC, Region I staff for further disposition.

The NRC staff concludes that the procedure used by the licensee to manage commitments is appropriate. However, the licensee misused the commitment management process to alter 10 obligations.

## 3.0 CONCLUSION

The NRC staff concludes, based on the above audit, that the licensee's procedure used to manage commitments provides the necessary attributes for an effective commitment management program. However, although the procedure itself is adequate, there have been numerous problems with adherence to the procedure. As such, the licensee's commitment management program has not been effective with respect to: tracking regulatory commitments; reporting to the NRC; and managing changes to commitments.

[3] ADAMS Accession No. ML050420058

## 4.0 LICENSEE PERSONNEL CONTACTED FOR THIS AUDIT

- W.Brown, Licensing Department
- M. Calderone, Licensing Department
- G. Closius, Licensing Department
- W. Bartron, Licensing Department

Principal Contributor: C. Sanders

Date: December 28, 2011

The NRC staff appreciates the resources that were made available by Millstone Station staff during the audit. If you have any questions, please contact me at (301) 415-1603.

Sincerely,

*/ra/*

Carleen J. Sanders, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-336 and 50-423

Enclosure:
Audit Report

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 13, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Nuclear Connecticut, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION, UNIT NO. 2 – REQUEST FOR ADDITIONAL INFORMATION REGARDING REQUEST FOR EXMEPTION FROM TITLE 10 OF THE *CODE OF FEDERAL REGULATIONS*, PART 50, APPENDIX R, SECTION III.G, "FIRE PROTECTION OF SAFE SHUTDOWN CAPABILITY" (TAC NO. ME6693)

Dear Mr. Heacock:

By letter dated June 30, 2011,[1] Dominion Nuclear Connecticut, Inc., submitted a request for exemption from Title 10 of the *Code of Federal Regulations*, Part 50, Appendix R, Section III.G, "Fire Protection of Safe Shutdown Capability" for Millstone Power Station, Unit No. 2 (MPS2). The proposed exemption would allow the use of operator manual actions in lieu of the requirements of 10 CFR 50, Appendix R, Section III.G.2. To complete its review, the Nuclear Regulatory Commission staff requests responses to the enclosed questions.

The draft questions were sent to Mr. William Bartron, of your staff, to ensure that the questions were understandable, the regulatory basis for the questions was clear, and to determine if the information was previously docketed. On January 6, 2012, Mr. William Bartron agreed that you would provide a response by February 29, 2012.

If you have any questions regarding this matter, please contact me at 301-415-1603.

Sincerely,

Carleen J. Sanders, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-336

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[1] Agencywide Documents Access Management System Accession No. ML11188A213

OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR ADDITIONAL INFORMATION

EXEMPTION FROM 10 CFR 50, APPENDIX R, SECTION III.G

FIRE PROTECTION OF SAFE SHUTDOWN CAPABILITY

MILLSTONE POWER STATION, UNIT NO. 2

DOCKET NO. 50-336

By letter dated June 30, 2011,[1] Dominion Nuclear Connecticut, Inc. (DNC or the licensee), submitted a request for exemption from Title 10 of the *Code of Federal Regulations*, Part 50, Appendix R, Section III.G, "Fire Protection of Safe Shutdown Capability" for Millstone Power Station, Unit No. 2 (MPS2). The proposed exemption would allow the use of operator manual actions (OMAs) in lieu of the requirements of 10 CFR 50, Appendix R, Section III.G.2.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the information provided by the licensee and has determined that the following additional information is needed in order to complete the review.

**RAI-01 Circumstances for Review**

In accordance with 10 CFR 50.12, the NRC will not consider granting an exemption unless special circumstances are present. Special circumstances are described in 10 CFR 50.12(a)(2). Only one circumstance needs to be met. Although 10 CFR 50.12(a)(2)(ii) is cited in the application, unwarranted burden is also mentioned. Unwarranted burden is the special circumstance described in 10 CFR 50.12(a)(2)(iii). In addition, the information supporting the special circumstance is inadequate. For example if 10 CFR 50.12(a)(2)(ii) is the special circumstance being met in this exemption, additional information on how the OMA's provide assurance that the underlying purpose of the rule is met is needed.

Please provide the following:

RAI-01.1: Clarify which special circumstance is being met?

RAI-01.2 Provide additional information supporting the special circumstance that is being met.

**RAI-02 Ensuring That One of the Redundant Trains is Free of Fire Damage**

Attachment 1, Page 3, "Conclusion" of the submittal asserts that the OMAs discussed in the request provide assurance that one train of systems necessary to achieve and maintain hot

[1] Agencywide Documents Access Management System Accession No. ML11188A213

shutdown remains available in the event of a fire. Attachment 1, Sections 3.0 and 4.0 of the submittal contain a description of each of the OMAs and the time required to perform them, but does not state whether or how one of the redundant trains in a particular fire area is maintained free of fire damage. There is no discussion regarding fire damage and when it will occur.

RAI-02.1: State the specific requirements of 10 CFR 50, Appendix R, Section III.G.2 that are not met for each of the requested exemptions, e.g., a lack of fire barriers, spatial separation, automatic suppression, etc.

RAI-02.2: Provide a summary of the plant-specific features that compensate for the lack of 10 CFR 50, Appendix R, Section III.G.2-required features identified in RAI-02.1, for each of the requested exemptions. For example, note any enhanced defense-in-depth measures such as a lack of ignition sources and/or combustibles, more robust and/or supplemental detection and suppression systems and other physical or administrative controls.

RAI-02.3: 10 CFR 50, Appendix R establishes the concept of defense-in-depth and requires operators be able to safely and reliably achieve and maintain hot shutdown capability from the control room. Provide a technical explanation that justifies how the proposed methods will result in a level of protection that is commensurate with that intended by 10 CFR 50, Appendix R, Section III.G.2.

RAI-02.4: Attachment 1, Page 28, Section 4.0, "Fire Area R-2" of the submittal states that a fire will affect all Facility Z2 shutdown components and that Facility Z1 is used to achieve and maintain hot standby. Similar statements are made throughout the submittal including Attachment 1, page 34 for Fire Area R-7, page 35 for Fire Area R-8, etc. Provide a description of Facility Z1 and Facility Z2 shutdown components including all components, their locations, separation from each other, etc.

**RAI-03 Other Evaluations**

Fire areas may have other exemptions or engineering evaluations that affect fire protection systems or safe shutdown capabilities.

RAI-03.1: Provide a discussion of any other exemptions or evaluations, including licensee-developed evaluations, e.g., Generic Letter 86-10 evaluations that impact this request in any way and provide a justification for why such impact should be considered acceptable and how the analysis remains valid in light of this exemption request.

**RAI-04 Fire Protection System and Fire Barrier Design Criteria**

Attachment 1, Section 2.0 of the submittal notes that several areas are equipped with various fire detection and suppression systems. However, the request does not state whether the systems have been designed and installed in accordance with recognized design standards.

RAI-04.1: Where fire protection features such as detection and suppression systems and fire rated assemblies are installed, describe the technical basis for such installations including the applicable codes, standards and listings.

For example:

Attachment 1, Section 2.0 of the submittal states that Fire Area R-14 contains portable fire extinguishers for suppression purposes, as well as ionization smoke detection that alarms at the main fire alarm panel in the control room. The submittal also states that hose stations and additional fire extinguishers are located in adjacent fire areas/zones. However, Attachment 1, Section 2.0 of the submittal does not state whether these systems/equipment have been installed and maintained in accordance with a particular design standard or basis, e.g. National Fire Protection Association (NFPA) 72: National Fire Alarm Code, 1985 Edition.

RAI-04.2: Provide a technical justification for any deviations from codes, standards and listings by independent testing laboratories in the fire areas that could impact this evaluation.

**RAI-05 Ignition Sources and Combustible Fuel Load**

The submittal includes information for each of the fire areas including floor area, combustible loading, potential ignition sources, available fire protection equipment and systems, and fire prevention methods. Additional information is required for the NRC staff to complete its review.

RAI-05.1: Provide the following additional information regarding the in situ and transient fire hazards that could threaten redundant equipment for each fire area included in the request:

- The cable type, e.g., thermoplastic or thermoset. If thermoplastic cables are used, provide a discussion of self-ignited cable fires.
- Actual dimensions of the rooms including ceiling heights (L x W x H).

**RAI-06 Fire Scenarios**

The submittal identifies fire scenarios and the OMAs needed in each fire area, but does not describe, in detail, the fire scenarios that have been considered for the postulated events. The request mentions "cables of concern" and "the subject cables" but the NRC staff could not identify specifically what cables were being referred to.

For example:

A fire that could potentially impact any cables of concern would likely involve diesel fuel oil. For a fire in Fire Area R-7, OMAs are required to provide decay heat removal and restore charging system flow to the RCS. However, no information is provided to describe the separation between the redundant train cables. It is also not clear where the cables are located relative to the floor, walls and other trains or whether any spatial separation exists between the two trains.

RAI-06.1: Provide a description of the proximity of the credited redundant train equipment to in situ hazards. Also describe the spatial relationship between two redundant trains in the fire area such that if the redundant trains are damaged, manual actions would be necessary. Provide information on "cables of concern" or "subject cables" to indicate cable type, quantity, function, location, etc.

**RAI-07 Staffing**

Attachment 1, Section 4.0 of the submittal states that it is assumed that there are three Plant Equipment Operators (PEOs) and a Reactor Operator available to perform the required OMAs and that there is an additional Appendix R PEO on shift in addition to the minimum staff identified in the Technical Specifications (TSs).

RAI-07.1: Confirm that individuals that may be needed to perform the operator manual actions do not have collateral duties, such as firefighting, security duties, or control room operation, during a postulated fire event.

**RAI-08 Time and Sequence Assumptions**

An action is considered feasible if it is shown that it is possible to be performed within the available time (considering relevant uncertainties in estimating the time available). Attachment 1, Section 4.0 of the submittal states that the walkdown time column includes diagnostic time as well as time to don personal protective equipment and obtain necessary tools. The OMA tables provide the action time (time to execute) separately. It is not apparent from the request that confirmation time was included in the time and sequence assumptions.

RAI-08.1: Provide additional information regarding the confirmation time including information that demonstrates that the proposed OMAs are feasible.

**RAI-09 Fire Area Proximity and Access**

Attachment 1, Section 2.0 of the submittal describes each fire area and includes statements about floor area, combustible loading, potential ignition sources, available fire protection equipment and systems, and fire prevention methods, but does not include any information about the nature and rating of the fire area boundaries or whether openings and penetrations exist in any rated barriers. Information about ventilation systems including how and when these systems activate and whether they have been designed to transport products of combustion

without causing additional damage to equipment or relocating the smoke to other fire areas has not been included.

RAI-09.1: Provide detailed information on the nature and rating of all fire area boundaries including whether opening and penetrations exist in rated barriers. Provide a technical justification for any non-rated fire protection assemblies.

RAI-09.2: Indicate whether the use of self-contained breathing apparatuses is necessary for each fire area or zone included in the request.

RAI-09.3: For adjacent fire areas or where operators will pass within close proximity of the fire affected area, provide a technical justification that demonstrates that a fire in the fire area would not impact the performance of the OMA.

RAI-09.4: Describe the ventilation systems in each area and state whether these ventilation systems are used for smoke evacuation or fire brigade operations and provide a justification for the systems capabilities.

**RAI-10 Reliability of Actions**

Attachment 1, Section 4.0 of the submittal includes data to show that adequate margin exists for all the operator manual actions, which is an indicator of feasibility and reliability.

RAI-10.1: Where a particular amount of time has been allocated for diagnosing an event, demonstrate that the additional uncertainties such as recovery from unexpected delays, environmental factors, operator response to stress, etc. are addressed by this time.

RAI-10.2: Provide a clear description of how the time needed to perform potential corrective or reactive actions in the event the action did not accomplish the desired result (i.e., "response not obtained") was factored into the OMA performance time and provide the technical basis for the time allotted for each reactive action.

**RAI-11 Required Operator Stations**

The submittal does not specify what has been assumed for the location from which operators are dispatched to perform the OMAs or whether scenarios were evaluated where operators were not at their assumed locations at the beginning of an event.

The location or activities of required plant personnel when the fire starts could delay their participation in executing the operator manual actions (e.g., they may be in a location that is on the opposite side of the plant from the main control room or may need to restore certain equipment before being able to participate or both).

RAI-11.1: Provide a justification for the assumption that operators will be located at an assumed location when the OMA procedure begins. If there isn't assurance that the operators will be at the assumed locations, provide the times required for them to reach the locations and indicate how these times are reflected in the analysis.

RAI-11.2: State whether the assumed times for operators to perform various tasks, such as 32 minutes for PEO-2 to open 2-CH-192 (Attachment 1, Page 36, Table 7), are reasonable. For instance, provide a justification for assuming that it will take PEO-2 32 minutes from the time they are directed to open 2-CH-192 to travel to and open the valve and then confirm that it is open.

January 13, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Nuclear Connecticut, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION, UNIT NO. 2 – REQUEST FOR ADDITIONAL INFORMATION REGARDING REQUEST FOR EXMEPTION FROM TITLE 10 OF THE *CODE OF FEDERAL REGULATIONS*, PART 50, APPENDIX R, SECTION III.G, "FIRE PROTECTION OF SAFE SHUTDOWN CAPABILITY" (TAC NO. ME6693)

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The draft questions were sent to Mr. William Bartron, of your staff, to ensure that the questions were understandable, the regulatory basis for the questions was clear, and to determine if the information was previously docketed. On January 6, 2012, Mr. William Bartron agreed that you would provide a response by February 29, 2012.

If you have any questions regarding this matter, please contact me at 301-415-1603.

Sincerely,

***/ra/***
Carleen J. Sanders, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-336

Enclosure:
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NUCLEAR REGULATORY COMMISSION
REGION I
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KING OF PRUSSIA, PENNSYLVANIA 19406-1415

January 23, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Resources
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION – NRC INTEGRATED INSPECTION REPORT 05000336/2011005 AND 05000423/2011005

Dear Mr. Heacock:

On December 31, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Millstone Power Station, Units 2 and 3. The enclosed inspection report documents the inspection results, which were discussed on January 11, 2012, with Mr. Stephen E. Scace, Site Vice President, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

No NRC-identified or self-revealing findings were identified during this inspection.

However, a licensee identified violation which was determined to be of very low safety significance is listed in this report. The NRC is treating this violation as a non-cited violation (NCV), consistent with Section 2.3.2 of the NRC Enforcement Policy.

If you contest this non-cited violation, you should provide a written response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Senior Resident Inspector at Millstone.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

Ronald R. Bellamy

Ronald R. Bellamy, PhD, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Docket Nos.: 50-336, 50-423
License Nos.: DRP-65, NPF-49

Enclosure: Inspection Report 05000336/2011005 and 05000423/2011005
w/Attachment: Supplemental Information

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In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RB/

Ronald R. Bellamy, PhD, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Docket Nos.: 50-336, 50-423
License Nos.: DRP-65, NPF-49

Enclosure: Inspection Report 05000336/2011005 and 05000423/2011005
w/Attachment: Supplemental Information

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REGION I

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| Docket Nos.: | 50-336, 50-423 |
| License Nos.: | DPR-65, NPF-49 |
| Report No.: | 05000336/2011005 and 05000423/2011005 |
| Licensee: | Dominion Nuclear Connecticut, Inc. |
| Facility: | Millstone Power Station, Units 2 and 3 |
| Location: | P.O. Box 128<br>Waterford, CT 06385 |
| Dates: | October 1, 2011 through December 31, 2011 |
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## SUMMARY OF FINDINGS

IR 05000336/2011005, 05000423/2011005; 10/01/2011-12/31/2011, Millstone Units 2 and 3; Routine Quarterly Integrated Report

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. No findings or violations were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

### Other Findings

A violation of very low safety significance that was identified by Dominion has been reviewed by the inspectors. Corrective actions taken or planned by Dominion have been entered into Dominion's corrective action program. This violation and corrective action tracking number is listed in Section 4OA7 of this report.

## REPORT DETAILS

Summary of Plant Status

Millstone Unit 2 operated at or near 100 percent power for the entire inspection period. Millstone Unit 3 began the inspection period operating at 100 percent power. On October 8, 2011, Unit 3 began a planned refueling outage and returned to 100 percent power on November 26, 2011. Unit 3 operated at or near 100 percent power for the remainder of the inspection period.

## 1. REACTOR SAFETY

### Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 1 sample)

Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

The inspectors performed a review of Dominion's readiness for the onset of seasonal cold weather. The review focused on Unit 2 steam heating for external tanks, the winter valve lineup for the reactor building closed cooling water (RBCCW) heat exchangers, the heating for the Emergency Diesel Generator (EDG) rooms, and Unit 3 electric heating for external tanks. The inspectors reviewed station procedures, including Dominion's seasonal weather preparation procedure and applicable operating procedures. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during cold weather conditions. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04Q – 2 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

Unit 2

- Service Water (SW) System while the 'A' train SW discharge piping from the RBCCW heat exchangers was isolated for repair on December 19, 2011

Unit 3

- Spent Fuel Pool Cooling when the reactor core was off-loaded into the spent fuel pool on October 25, 2011

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted system performance. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether Dominion staff had properly identified equipment issues and entered them into the corrective action program for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

.2 Full System Walkdown (71111.04S – 1 sample)

a. Inspection Scope

On October 20 - 22, 2011, the inspectors performed a complete system walkdown of accessible portions of the Unit 3 residual heat removal system to verify the existing equipment lineup was correct. The inspectors reviewed drawings, equipment line-up check-off lists, and work-related tagging to verify the system was aligned to perform its required safety functions. The inspectors performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. Additionally, the inspectors reviewed a sample of related condition reports to ensure Dominion appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection

Resident Inspector Quarterly Walkdowns (71111.05Q – 4 samples)

a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that Dominion controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression

equipment was available for use as specified in the area pre-fire plan, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for out-of-service (OOS), degraded or inoperable fire protection equipment, as applicable, in accordance with procedures.

Unit 2

- East 480V Load Center Room, Fire Area A-28

Unit 3

- Fuel Building, Fire Area FB-1
- Containment, Fire Area RC-1
- Intake Structure, Fire Area CWS-1

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)

Internal Flooding Review

a. Inspection Scope

The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), the site flooding analysis, and plant procedures to assess susceptibilities involving internal flooding. The inspectors also reviewed the corrective action program to determine if Dominion identified and corrected flooding problems and whether operator actions for coping with flooding were adequate. The inspectors also focused on Unit 3 EDG room areas to verify the adequacy of equipment seals located below the flood line, floor and water penetration seals, watertight door seals, common drain lines and sumps, and temporary or removable flood barriers.

b. Findings

No findings were identified.

1R08 In-Service Inspection (71111.08 - 1 sample)

a. Inspection Scope

From October 17-27, 2011, the inspectors conducted a review of Dominion's implementation of in-service inspection (ISI) program activities for monitoring degradation of the reactor coolant system boundary and risk significant piping system boundaries for Millstone Unit 3 using the criteria specified in the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI. The sample selection was based on the inspection procedure objectives and risk priority of those components and systems where degradation would result in a significant increase

in risk of core damage. The inspectors observed in-process non-destructive examinations (NDE), reviewed inspection documentation, and interviewed inspection personnel to verify that the activities were performed in accordance with the ASME Boiler and Pressure Vessel Code Section XI requirements.

Non-Destructive Examination Activities

The inspectors performed observations of NDE activities in process and reviewed documentation of the examinations listed below:

- Manual Ultrasonic Test (UT), Unit 3 reactor pressure vessel upper closure head meridonal weld, 101-104D, UT Examination Report No. M3-UT-11-048, October 22, 2011
- Manual encoded phased array UT, Unit 3 reactor pressure vessel upper closure head weld, 101-104D, October 24, 2011
- Manual UT, 10" safety injection system transition to valve (V-5) weld, SIL-8-FW-3, UT Examination Report No. M3-UT-11-50, October 23, 2011
- Manual UT, 2" Reactor Coolant System (RCS) loop 'B' elbow to pipe butt weld, component identification number 408005, UT Examination Report No. M3-UT-11-025, October 23, 2011, and M3-UT-11-026, October 24, 2011
- Magnetic Particle Test (MT), 16" 'A' Steam Generator (SG) feedwater reducing elbow to nozzle weld, FWS-23A-FW-125, MT Examination Report No. M3-MT-11-016, October 23, 2011, and M3-MT-11-017, October 23, 2011; and radiographic testing (RT) inspection report M3-1182, October 23, 2011
- Bare metal visual test examination of Unit 3 Reactor Pressure Vessel Upper Closure Head RPVUCH and control rod drive mechanism (CRDM) penetrations, October 25, 2011

The inspectors reviewed the five flaw indications identified during manual UT examination of the Millstone Unit 3 RPVUCH meridonal weld 101-104D, documented in UT examination report number M3-UT-11-048 and CR449133 to verify that the relevant indications were compared to previous examinations to determine if any changes have occurred and to verify that the indications were dispositioned in accordance with ASME Section XI, IWA requirements.

Further characterization scanning was performed to fully characterize the indications for comparisons to the ASME Section XI acceptance standards. This inspection found that the indications were stacked very close on top of each other and were difficult to determine which signals belonged with each indication. In order to resolve these indications the following actions were taken by Dominion: graphically plotted the indications to determine which indications needed to be combined; evaluated the preliminary UT data to determine whether they could be accepted by evaluation to code requirements; and, manual encoded data phased array UT inspection was performed to record and separate the individual indications so that worst case bounding dimensions need not be used in the fracture analysis.

The manual encoded data phased array UT successfully resolved these areas and dimensioned 45 separate small indications in meridonal weld 101-104D. These indications were all located in the weld volume and within 2 inches from the outside surface of the RPVUCH. The signal's characteristics resembled typical fabrication type

indications. The indications were not surface connected and were similar to embedded inclusions during the initial fabrication welding process. Each of the indications was characterized in accordance with ASME Section XI, IWA-3300 and all were identified as subsurface planar flaws. The indications were individually evaluated in accordance with IWB-3510 acceptance standards and found to be acceptable. Additionally, several of the indications were combined due to the proximity of each other and the bounding dimensions were evaluated as acceptable for continued service in accordance with IWB-3510 acceptance standards.

Unit 3 Reactor Pressure Vessel Upper Closure Head Inspection Activities

The inspectors directly observed portions of the remote bare metal visual inspection of the Millstone Unit 3 RPVUCH and reviewed the examination report to confirm appropriate coverage was achieved, verify no boric acid leakage or wastage was observed, and that the remote visual inspection was conducted in accordance with Dominion's visual examination procedure and in accordance with 10 CFR 50.55a(g)(6)(ii)(D).

Unit 3 Repair/Replacement Consisting of Welding Activities

The inspectors reviewed the repair/replacement activity associated with replacement of a portion of the 'A' train of SW return line 3-SWP-006-35-3A, a 6 inch diameter pipe comprised of SB446 alloy 706 CU-NI butt welded piping located in the enclosure tube of the Control Building (work order 53102460129). The work order was generated due to low wall thickness UT results. Welding and NDE activities were performed in accordance with Specification SP-ME-572, Class 158 and ASME Section XI, 2004 Edition, IWD requirements.

Boric Acid Corrosion Control Program Inspection Activities

The inspectors discussed the boric acid control program (BACCP) with the Dominion BACCP owner and sampled photographic inspections of boric acid found on safety related piping and components inside the Millstone Unit 3 Containment during the Mode 3 walkdowns performed by Dominion personnel, which was observed by the NRC resident inspectors, to verify that the visual inspections were performed in accordance with the Millstone BACCP inspection procedure and that deficient conditions were identified and documented in the corrective action program.

The inspectors reviewed a sample of engineering evaluations and corrective actions associated with boric acid deficiencies and verified that condition reports were assigned corrective actions consistent with the requirements of the ASME Code and 10 CFR Part 50, Appendix B, Criterion XVI.

Steam Generator Tube Inspection Activities

The inspectors reviewed the Millstone Unit 3 SG Eddy Current Testing (ECT) tube examinations, and applicable procedures for monitoring degradation of SG tubes to verify that the SG examination activities were performed in accordance with the rules and regulations of the SG examination program, Dominion Steam Generator Program, Unit 3 Eddy Current Data Analysis Reference Manual U3-24-SIP-REF01, NRC Generic

Letters, Code of Federal Regulations 10 CFR Part 50, Technical Specifications for Millstone Unit 3, Nuclear Energy Institute 97-06 Steam Generator Program Guidelines, Electric Power Research Institute (EPRI) Pressurized-Water Reactor (PWR) Steam Generator Examination Guidelines, and the ASME Boiler and Pressure Vessel Code Sections V and XI. The review also included the Millstone Unit 3 Steam Generator Integrity Degradation Assessment (R14) and Millstone Unit 3 Steam Generator Condition Monitoring and Operational Assessment.

The inspectors reviewed the SG inspection plan. The SG inspection plan for 3R14 outage included ECT of 100 percent of all operational tubes in SGs 'A' and 'C'. The inspectors observed a sample of eddy current testing of the two SGs inspected and reviewed ECT data for various SG tubes. Several of the samples selected for review represented tubes that exhibited various anomalies such as localized wear and loose parts wear in SG 'A' that were identified as needing repair by plugging.

Dominion identified and removed from service a total of 11 tubes in SG 'A'. The inspectors verified the following SG tubes were removed from service: seven tubes plugged due to a Bottom of Expansion Transition (BET) position more than 1" below the top of tube sheet; two tubes plugged due to anti-vibration bar wear equal to or greater than 37 percent thru-wall; one tube due to foreign object wear of 72 percent thru-wall (stabilized and plugged); and one tube was preventatively plugged due to an anti-vibration bar wear flaw at the apex of the u-bend. The inspectors verified that no SG tubes were identified requiring in-situ pressure testing during 3R14, and no SG tube leakage was reported during the previous operating cycle.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11 – 2 samples)

a. Inspection Scope

The inspectors observed licensed operator simulator training for Unit 2 on November 17, 2011, which included a scenario with a loss of all feedwater to the SGs. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the technical specification action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

The inspectors observed licensed operator simulator and classroom training for Unit 3 on November 30, 2011, which included a scenario with a plant shutdown to Mode 4 from outside of the control room in the simulator, Emergency Response Organization (ERO) classroom training for Shift Managers and SROs, and Fatigue Rule/EmpCenter Software Training for Operations Supervisors. The inspectors evaluated operator performance

during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the technical specification action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems. The inspectors also reviewed the ERO examination to verify classroom training was effective.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12 – 2 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on SSC performance and reliability. The inspectors reviewed system health reports, corrective action program documents, maintenance work orders, and Maintenance Rule basis documents to ensure that Dominion was identifying and properly evaluating performance problems within the scope of the Maintenance Rule. For each sample selected, the inspectors verified that the SSC was properly scoped into the Maintenance Rule in accordance with 10 CFR 50.65 and verified that the (a)(2) performance criteria established by Dominion staff was reasonable. As applicable for structure, systems and components (SSCs) classified as (a) (1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a) (2) status. Additionally, the inspectors ensured that Dominion staff was identifying and addressing common cause failures that occurred within and across Maintenance Rule system boundaries.

Unit 3

- 125 Volt DC Power
- Auxiliary Building Ventilation

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 5 samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that Dominion performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety

cornerstones. As applicable for each activity, the inspectors verified that Dominion personnel performed risk assessments as required by 10 CFR 50.65 paragraph (a)(4) and that the assessments were accurate and complete. When Dominion performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the technical specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

Unit 2

- Orange Risk Assessment for the cumulative Out of Service (OOS) time for the 'A' circulating water pump and 'A' SW pump on November 10, 2011

Unit 3

- Yellow Risk Assessment for Reactor Coolant System (RCS) drain down to decreased inventory for refueling on October 14, 2011
- Yellow Risk Assessment for RCS drain down to decreased inventory to install reactor vessel head on November 1, 2011
- Troubleshooting efforts for Inverter 4 during yellow risk conditions November 1 and 2, 2011
- Emergent Work for 6.9 KV feeder cables from Reserve Station Service Transformer (RSST) 'B' on November 3 and 4, 2011

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 6 samples)

a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions:

Unit 2

- Operability Determination (OD) 000459 which covered the through wall flaw on 'A' SW header
- Temporary modification 3-11-024 which demonstrated operability of the 'A' train of RHR with MOV 8701A's motor removed in Mode 5 and 6

Unit 3

- CR 448188 which covered the operability of Westinghouse 7300 process control cards with respect to seismic qualification

- CR452896 which identified that the turbine driven auxiliary feedwater pump flow did not meet the flow rate acceptance criteria during surveillance testing

- OD 000463 which covered the potential for EDG overloading at Tech Spec 60.8 Hz after six hours of operation during a steam/feed line break event
- CR452946 which identified that EEQ/TRM 3.7.14 temperature limits were exceeded in the TDAFW pump valve room

The inspectors selected these issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the operability determinations to assess whether technical specification operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the technical specifications and UFSAR to Dominion's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled by Dominion. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 2 samples)

.1 Temporary Modifications

a. Inspection Scope

The inspectors reviewed a temporary modification to the Unit 3 neutron flux monitoring system described in Temporary Modification (TM) 3-11-025, "Temporary Change to use a Non-seismically Qualified Neutron Detector for Channel 1 Source Range / Intermediate Range Instrument 3NMS*DET31," to determine whether the modifications affected the safety functions of systems that are important to safety. The inspectors reviewed the 10 CFR 50.59 and post-modification test plan to verify that the temporary modification did not degrade the design bases, licensing bases, and performance capability of the affected systems.

b. Findings

No findings were identified.

.2 Permanent Modifications

a. Inspection Scope

The inspectors evaluated a modification to the Unit 3 feedwater regulating bypass valves implemented by engineering change package MP3-11-01005, "Feedwater Regulating Bypass Valves Positioner/SOV Replacement." The inspectors verified that the design

bases, licensing bases, and performance capability of the affected systems were not degraded by the modification. In addition, the inspectors reviewed modification documents associated with the upgrade and design change. The inspectors also reviewed the work order, walked-down the completed installation, and verified that the appropriate post maintenance testing was performed to ensure that the modification worked as designed.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 7 samples)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed the test procedure to verify that the procedure adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure was consistent with the information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed the test or reviewed test data to verify that the test results adequately demonstrated restoration of the affected safety functions.

Unit 2

- Post maintenance testing in accordance with work order 53102465674 for the 'A' circulating water pump replacement on November 29, 2011

Unit 3

- Post Maintenance Test for the 'A' EDG following a seven day overhaul
- Post Maintenance Test for Source Range N32 and Intermediate Range N36 Detectors
- Post Maintenance Test for the 'B' RCP motor replacement
- SP 3622.3-005, "TDAFW Pump IST Comprehensive Pump and Check Valve Test," Revision 004-03, following turbine overhaul and steam admission valve maintenance
- SP3616A.1-006, "Mode 2, 3, or 4 Single Train Stroke and Failure Test of MSIVs," Revision 008-03, following overhaul of 'A' Main Steam Isolation Valve
- Post Maintenance test for the 'C' Condensate Pump replacement

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 – 1 sample)

a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the Unit 3 maintenance and refueling outage (3R14), which was conducted October 8 through November 26, 2011. The inspectors reviewed Dominion's development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. During the outage, the inspectors observed portions of the shutdown and cooldown processes and monitored controls associated with the following outage activities:

- Configuration management, including maintenance of defense-in-depth, commensurate with the outage plan for the key safety functions and compliance with the applicable technical specifications when taking equipment out of service
- Implementation of clearance activities and confirmation that tags were properly hung and that equipment was appropriately configured to safely support the associated work or testing
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication and instrument error accounting
- Status and configuration of electrical systems and switchyard activities to ensure that technical specifications were met
- Monitoring of decay heat removal operations
- Impact of outage work on the ability of the operators to operate the spent fuel pool cooling system
- Reactor water inventory controls, including flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss
- Activities that could affect reactivity
- Maintenance of secondary containment as required by technical specifications
- Refueling activities, including fuel handling and core reload
- Fatigue management
- Identification and resolution of problems related to refueling outage activities

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 6 samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs to assess whether test results satisfied technical specifications, the UFSAR, and Dominion procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed

as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

Unit 2

- SP 2611B, "'C' RBCCW Pump IST," Revision 002-01

Unit 3

- SP 3712G, "Main Steam Code Safety Valve Surveillance Testing," Revision 011-02
- SP 3646A.17, "Train 'A' ESF with LOP Test (ICCE)," Revision 018-05
- VPROC ENG11-3-008, "Containment Integrated Leak Rate Test Type 'A' (ICCE)," Revision 000-01
- SP 3622.3, "TDAFW Pump Operational Readiness and Quarterly IST Group 'B' Pump Test," Revision 014-03
- SP3608.4, "HPSI Vent Valves - Train 'A' and Common Header," Revision 006-05

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness**

1EP6 Drill Evaluation (71114.06 – 1 sample)

Training Observations

a. Inspection Scope

The inspectors observed a simulator training evolution for Unit 2 licensed operators on November 17, 2011, which required emergency plan implementation by an operations crew. This evolution included an evaluation of performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crew. The inspectors also attended the post-evolution critique for the scenario. The focus of the inspector's activities was to note any weaknesses and deficiencies in the crew's performance and ensure that Dominion evaluators noted the same issues and entered them into the corrective action program.

b. Findings

No findings were identified.

## 2. RADIATION SAFETY

### Cornerstone: Occupational Radiation Safety

2RS01 Radiological Hazard Assessment and Exposure Controls (71124.01)

a. Inspection Scope

During the period October 17 - 20, 2011, the inspectors performed the following activities to verify that Dominion was evaluating, monitoring, and controlling radiological hazards for work performed during the 3R14 refueling outage in locked high radiation areas (LHRA) and other radiological controlled areas, including a Unit 2 reactor building containment (RBC) entry during power operations. Implementation of these controls was reviewed against the criteria contained in 10 CFR Part 20, technical specifications, and with Dominion procedures.

Radiological Hazards Control and Work Coverage

The inspectors identified work performed in radiological controlled areas in Units 2 and 3, and evaluated Dominion's assessment of the radiological hazards. The inspectors evaluated the radiological survey maps, exposure control evaluations, electronic dosimeter dose/dose rate alarm setpoints, and radiation work permits (RWP), associated with these areas, to determine if the exposure controls were acceptable. Specific work activities evaluated included: Reactor Disassembly and Assembly (RWPs 3110301, 3110302, 3110303, and 3110318); Install/Remove Scaffolding in Containment (RWP3110331); and Insulation Removal and Installation (RWP 3110226 and 30110326). For the Unit 2 RBC entry, the inspectors reviewed RWP 2110090 and attended the pre-job planning meeting.

For selected tasks, the inspectors attended the pre-job briefings and discussed the job assignments with the workers. The inspectors also observed outage work activities from the centralized remote monitoring system and during the tours of containment. The implementation of As Low As Reasonably Achievable (ALARA) controls for reactor disassembly, refueling, disassembling/removing of scaffolding from containment, removal/re-installing insulation, in-service inspection and primary and secondary steam generator tasks was verified during walkdowns and observations using the remote monitoring system.

The inspectors reviewed the air sample records for samples taken in various locations in containment to determine if the samples collected were representative of the breathing air zone and analyzed/recorded in accordance with established procedures. During tours of the Unit 3 containment building, the inspectors verified that portable air samplers and continuous air monitors were strategically located to assure that potential airborne contamination could be identified in a timely manner. The continuous air monitors were all located in low background areas to ensure adequate sensitivity.

The inspectors toured accessible radiological controlled areas in the Unit 3 containment building and with the assistance of a radiation protection technician, performed independent radiation surveys of selected areas to confirm the accuracy of survey data,

and the adequacy of postings. Radiation protection technicians were questioned regarding their knowledge of plant radiological conditions for selected work activities and the ALARA controls for the work activities they were assigned to cover.

Additionally, the inspectors reviewed the RWPs developed for other work performed during 3R14. In particular, the inspectors reviewed the electronic dosimeter dose/dose rate alarm setpoints, stated on the RWP, to determine if the setpoints were consistent with the survey indications and plant policy.

Instructions to Workers

By attending pre-job briefings, the inspectors determined that workers performing radiological significant tasks were properly informed of electronic dosimeter alarm setpoints, low dose waiting areas, stay times (if applicable), and work site radiological conditions. By observing work-in-progress, the inspectors determined that doses were appropriately monitored to assure no procedural dose limits were exceeded.

During tours of containment, the inspectors determined that LHRA and a very high radiation area (VHRA) had the appropriate warning signs and were secured. Additionally, the inspectors identified that low dose waiting areas were appropriately surveyed, identified, and used by personnel. In addition, the inspectors identified radiation "hot spots" and verified that they were conspicuously labeled or posted to warn workers of high radiation levels.

The inspectors inventoried the keys to LHRAs in containment and the auxiliary building to determine if the keys were appropriately controlled, as required by technical specifications and station procedures. The inspectors also determined that no changes have been made to decrease the effectiveness and level of worker protection associated with LHRA and VHRA since the last inspection.

Contamination and Radioactive Material Control

During tours of containment, the inspectors confirmed that contaminated materials were properly bagged, surveyed, labeled or tagged and segregated from work/traffic areas. The inspectors observed workers and Health Physics (HP) Technicians using small article contamination monitors and performing contamination surveys to determine if various tools/equipment were potentially contaminated and met criteria for releasing the materials from the radiological control area (RCA). The inspectors reviewed Analysis Calculation No. RP-08-06 for the Small Article Monitor (SAM) Model 12 and the most recent SAM Calibration Summary Reports to determine if the instrument sensitivities met the Minimum Detectable Activity requirements.

Radiological Hazards Control and Work Coverage

By walkdowns and observing several work activities in containment on the remote monitoring system, the inspectors determined that workers wore the appropriate protective equipment, had dosimetry properly located on their bodies, and were under the positive control of radiation protection personnel. Clear radio communications were established between the radiation protection technicians at the centralized remote

monitoring system and the radiation protection technicians at the job sites. Worker doses were properly measured and supervisory personnel controlled the movements of the workers to assure that exposures were reduced.

Radiation Worker Performance

During job performance observations, the inspectors determined that workers were aware of RWP requirements, dose/dose rate alarm settings on the electronic dosimeter, and were aware of "hot spots" and low dose waiting areas at the work site. Additionally, the inspectors determined that radiation protection technicians were aware of RWP controls/limits applied to various tasks and provided positive control of workers to reduce the potential of unplanned exposure and personnel contaminations.

Problem Identification and Resolution

A review of Dominion's self-assessment reports, dose/dose rate alarm reports, personnel contamination events, and associated condition reports was conducted. The inspectors determined that problems and negative performance trends were entered into the corrective action program and were evaluated for resolution.

Relevant condition reports (CR), associated with radiation protection control access and radiological hazard assessment, initiated between April and October 2011, were reviewed and discussed with Dominion's staff to determine if the follow up activities were being conducted in an effective and timely manner, commensurate with their safety significance.

b. Findings

No findings were identified.

2RS02 Occupational ALARA Planning and Controls (71124.02)

a. Inspection Scope

During the period October 17 - 20, 2011, the inspectors performed the following activities to verify that Dominion was properly implementing operational, engineering, and administrative controls to maintain personnel exposure ALARA for work activities performed during the Unit 3 refueling outage (3R14) and for a Unit 2 RBC entry at power. Implementation of this program was reviewed against the criteria contained in 10 CFR Part 20, applicable industry standards, and with Dominion procedures.

Radiological Work Planning

The inspectors reviewed pertinent information regarding site collective-dose history, current collective-dose totals, annual department collective-dose goals, and the outage collective-dose estimates and department dose goals for 3R14. The inspectors reviewed six 3R14 Outage ALARA Plans for jobs estimated to exceed five person-rem, including: AP 3-11-01 Rx Disassembly/Assembly; AP 3-11-02 SG Secondary; AP 3-11-09 Mechanical; AP 3-11-11 Valve Testing and Repair; AP 3-11-13 Scaffolding; and AP 3-11-14 Insulation.

The inspectors reviewed the exposure status for tasks performed during the Unit 3 outage and compared actual collective dose with the estimates contained in various project ALARA Plans (AP). In particular, the inspectors evaluated the effectiveness of ALARA controls for all jobs that were estimated to exceed five person-rem.

The inspectors reviewed the Work-In-Progress ALARA reviews for the jobs whose actual dose approached 50 percent of the estimated collective-dose.

The inspectors attended a Station ALARA Committee (SAC) meeting to evaluate the departmental interfaces between radiation protection, operations, maintenance crafts, and engineering to identify missing ALARA program elements and interface problems.

Verification of Dose Estimates

The inspectors reviewed the assumptions and basis for the collective dose estimates for the dose significant jobs performed during the 3R14 outage. The inspectors also reviewed the revisions made to various dose estimates associated with the ALARA Plans due to changes in radioactive source term (i.e., lower dose rates) or changes in work scope.

The inspectors evaluated the implementation of Dominion procedures associated with monitoring and re-evaluating dose estimates when the dose estimates for tasks exceeded the actual exposures. Included in the review were Work-In-Progress reports that evaluated the effectiveness of ALARA measures, including source term controls, and actions by the SAC to subsequently change collective dose from the original estimates.

Additionally, the inspectors reviewed the exposures for the ten workers receiving the highest doses for calendar year 2011 to confirm that no individual exceeded the regulatory limits or performance indicator thresholds.

Source Term Reduction and Control

The inspectors reviewed the status and historical trends for the Unit 3 radioactive source term. Through review of survey maps and interviews with the Primary Chemist and Chemistry Manager, the inspectors evaluated recent source term measurements and control strategies. Specific strategies being employed included use of macro-porous clean up resin, cobalt dissolution/cleanup prior to shutdown, and maintaining an elevated coolant pH.

The inspectors evaluated the effectiveness of temporary shielding by reviewing results from pre/post-installation radiation surveys for selected components having elevated dose rates. Shielding packages were reviewed for reactor head stand, piping in A/B/C/D loops, 3CHSRV8117 valve, two SG man-way diaphragms, SG hand holes, Reactor Vessel Level Indication System, SG upper and lower level platforms, and RCS crossover piping.

Job Site Inspections

During plant tours, the inspectors assessed the implementation of ALARA controls specified in ALARA Plans and RWPs, for Reactor Disassembly and Assembly, Scaffolding and Insulation.

The inspectors also observed workers performing scaffolding installation, in service inspection, valve repair, and refueling. Workers were questioned regarding their knowledge of job site radiological conditions, ALARA measures applied to their tasks and dose alarm settings for their electronic dosimeter.

Problem Identification and Resolution

The inspectors reviewed elements of Dominion's corrective action program (CAP) related to implementing the ALARA program to determine if problems were being entered into the program for timely resolution, the comprehensiveness of the cause evaluation, and the effectiveness of the corrective actions. Specifically, CRs related to programmatic dose challenges, personnel contaminations, dose/dose rate alarms, and the effectiveness in predicting and controlling worker exposure were reviewed.

b. Findings

No findings were identified.

2RS03 In-Plant Airborne Radioactivity Control and Mitigation (71124.03)

a. Inspection Scope

During the period October 17 - 20, 2011, the inspectors conducted the following activities to verify that in-plant airborne concentrations of radioactive materials are being controlled and monitored, and to verify that respiratory protection devices are properly selected and used by qualified personnel.

Implementation of these programs was evaluated against the criteria contained in 10 CFR Part 20, applicable industry standards, and Dominion's procedures.

Engineering Controls

The inspectors evaluated the use of portable continuous air monitors (AMS-4) and portable high efficiency particulate air (HEPA) ventilation systems installed in containment during the 3R14 outage. The inspectors determined that the air monitors were located at strategic work locations where airborne contamination could potentially occur; e.g., SG primary side openings, 51' Elevation above the reactor cavity, loop outer annulus on the 24' Elevation in containment. The inspectors reviewed testing records for portable HEPA ventilation systems and portable vacuum cleaners to determine that procedural performance criteria were met.

Respiratory Protection

The inspectors reviewed the use of respiratory protection devices worn by workers and the associated respiratory protection program. The inspectors reviewed air sampling records, any locations/work activities where respirators were prescribed to be used on an RWP, and any total effective dose equivalent (TEDE) ALARA derived air concentration (DAC) evaluations to determine if the use of respiratory protection devices was commensurate with the potential external dose that may be received when wearing these devices. No respiratory protection devices had been used for radiological work activities prior to or during the inspection. An installed breathing air system was not available for inspection.

Problem Identification and Resolution

The inspectors reviewed elements of Dominion's corrective action program related to implementing the airborne monitoring program to determine if problems were being entered into the corrective action program for timely resolution, the comprehensiveness of the cause evaluation, and the effectiveness of the corrective actions. Specifically, CRs related to monitoring challenges, personnel contaminations, dose assessments, and the reliability of monitoring equipment were reviewed.

b. Findings

No findings were identified.

2RS04 Occupational Dose Assessment (71124.04)

a. Inspection Scope

During the period October 17 - 20, 2011, the inspectors conducted the following activities to verify the accuracy and operability of personal monitoring equipment and the effectiveness in determining a worker's total effective dose equivalent (TEDE). Implementation of this program element was evaluated against the criteria contained in 10 CFR Part 20, applicable industry standards, and with Dominion's procedures.

External Dosimetry

The inspectors reviewed Dominion's Electronic Dosimeter Dose/Dose Rate Alarm Reports for the period April to October 18, 2011. No dose setpoint alarm reports were recorded during that period. The dose rate alarms in most cases were expected. No trends showing conditions adverse to quality were noted.

Internal Dosimetry

The inspectors evaluated the equipment and methods used to assess worker dose resulting from the uptake of radioactive materials. Included in this review were bioassay procedures, whole body counting equipment (FastScan, AccuScan, portal contamination monitors) calibration checks and operating procedures, and the analytical results for in-vivo and in-vitro bioassays.

The inspectors determined that the procedural methods include techniques to distinguish internally deposited radioisotopes from external contamination, methods to assess dose from hard-to-measure radioisotopes, and methods to distinguish ingestion pathways from inhalation pathways.

The inspectors reviewed the results from two internal dose assessments. The Analysis Calculation No RP-11-12 approved on July 7, 2011 to assess the committed effective dose equivalent (CEDE) to divers who entered the Millstone Unit 2 Spent Fuel Pool during 2R20 was reviewed. A calculation error was identified by the inspectors, having a minor consequence. The error was immediately corrected by Dominion and the analysis calculation will be revised (CR448780) and the dose assessment results will be corrected. The second Analysis Calculation No. RP-11-01 was approved on March 24, 2011 to assess the CEDE from a personnel contamination event for a worker who was contaminated while performing a leak inspection in the Millstone Unit 2 L-18 filter block house. No individual's CEDE exceeded 10 mrem.

Special Dosimetric Situations - Declared Pregnant Workers

The inspectors reviewed the procedural controls, and associated records, for managing declared pregnant workers (DPW) and determined that no DPWs were employed during the Unit 3 outage. Dominion informs workers of the risk of radiation exposure to the embryo/fetus, has a mechanism to control exposures to DPW and embryo/fetus, and has procedures for calculating dose to the embryo/fetus in accordance with Regulatory Guide 8.36 Radiation Dose to the Embryo/Fetus.

Multi-Dosimetry Methods

The inspectors reviewed Dominion's procedures for monitoring external dose where significant dose-rate gradients exist at the work site. At the time of the inspection, multi-dosimetry methods were not used for 3R14; therefore, the associated Effective Dose Equivalent (EDE) dose assessments could not be reviewed. The inspectors did review the procedures for assessing EDE using the multi dosimetry method, namely RPM 1.3.8 Criteria for Dosimetry Issue and RP-AA-123 for EDE. The method for determining EDE was consistent with Regulatory Guide 8.40. The inspectors noted that Dominion has committed to the NRC to measuring the dose to combined compartments by locating the dosimeter at the highest exposed portion of the combined compartment (CR448775).

Problem Identification and Resolution

The inspectors reviewed elements of Dominion's corrective action program related to implementing the dosimetry program to determine if problems were being entered into the program for timely resolution, the comprehensiveness of the cause evaluation, and the effectiveness of the corrective actions. Specifically, CRs related to dose assessments, personnel contaminations, and dose/dose rate alarms were reviewed.

b. Findings

No findings were identified.

## 4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Safety System Functional Failures (2 samples)

a. Inspection Scope

The inspectors sampled Dominion's submittals for the Safety System Functional Failures performance indicator for both Units 2 and Unit 3 for the period of October 1, 2010 through September 30, 2011. To determine the accuracy of the performance indicator data reported during those periods, inspectors used definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 10 CFR 50.73." The inspectors reviewed Dominion operability assessments, Maintenance Rule records, CRs, event reports and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

.2 Occupational Exposure Control Effectiveness (1 sample)

a. Inspection Scope

The inspectors reviewed implementation of Dominion's Occupational Exposure Control Effectiveness Performance Indicator (PI) Program. Specifically, the inspectors reviewed dosimetry alarm reports, condition reports, and associated documents, for occurrences involving locked high radiation areas, very high radiation areas, and unplanned exposures against the criteria specified in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline," to verify that all occurrences that met the NEI criteria were identified and reported as performance indicators. The period covered in this review was October 2010 through September 2011. This inspection activity represents the completion of one sample relative to this inspection area; completing the annual inspection requirement.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 4 samples)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that Dominion entered issues into the corrective action program

at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the corrective action program.

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a semi-annual review of site issues, as required by Inspection Procedure 71152, "Problem Identification and Resolution," to identify trends that might indicate the existence of more significant safety issues. In this review, the inspectors included repetitive or closely-related issues that may have been documented by Dominion outside of the corrective action program, such as trend reports, performance indicators, major equipment problem lists, system health reports, Maintenance Rule assessments, and maintenance or corrective action program backlogs. The inspectors also reviewed Dominion's CAP database to assess CRs written in various subject areas (equipment problems, human performance issues, etc.), as well as individual issues identified during the NRCs daily condition report review (Section 4OA2.1). The inspectors reviewed the Dominion quarterly trend report for the third quarter of 2010, conducted under PI-AA-200-2001, "Trending," to verify that Dominion's personnel were appropriately evaluating and trending adverse conditions in accordance with applicable procedures. The inspectors also reviewed effectiveness reviews associated with root cause and apparent cause evaluations.

b. Findings and Observations

No findings were identified.

The third quarter trend report identified declining performance in Performance Improvement Performance Objectives and Criteria Precursors over the last 18 months, due mainly to untimely and inadequate corrective actions. NRC inspection findings are consistent with this trend. In the past two years, the inspectors have documented six findings related to untimely or inadequate corrective actions. Specifically, the findings documented out-of-calibration results for safety-related inverters, main steam safety valve exhaust bushing failures, Unit 2 feedwater regulating valve failures, dealloying of aluminum bronze valves, failed banjo bolts on the EDGs, and Unit 3 feedwater bypass valve controls issues.

In 2010, there were 21 effectiveness reviews completed and all were evaluated as effective. In 2011 to date, there have been 31 effectiveness reviews, four were evaluated as ineffective and two were evaluated as indeterminate. The four ineffective evaluations were on the Unit 2 safety valve exhaust bushing failures EFR000255, deferred preventive maintenance EFR000331, and two on recommendations from SOER 10-2, CA186302 and CA186091. The inspectors identified that a new CR was

not written for the ineffective corrective actions to prevent recurrence (CAPRs) on EFR000255 as is required by Dominion procedure PI-AA-200-2002, "Effectiveness Reviews." However, because the procedure is administrative in nature and the failure to write the CR had no safety significance, the inspectors determined that the issue was of minor significance and is not subject to enforcement action in accordance with the NRC's Enforcement Policy.

The two indeterminate evaluations were maintenance on spare critical large motors, EFR000229, and engineering backlog and design change quality, EFR000307. The inspectors identified that both effectiveness reviews had requested follow on assignments to perform additional effectiveness reviews; however, no assignments were created. Dominion entered the issues into their CAP, CR456719 and EFR000374, respectively. Additionally, the inspectors identified that two effectiveness reviews that were evaluated as effective have had similar repeat occurrences. EFR000224, 2008 Unit 2 main steam safety valve failures, determined the corrective actions to be effective, yet in October 2011, Unit 3 had two failures of main steam safety valves. EFR000242, Unit 3 2009 Licensed Operator Initial Training (LOIT) class high failure rate, determined the corrective actions to be effective, yet, in January 2011, Unit 2 LOIT class had a high failure rate. In both instances, the causes were similar.

.3 Annual Sample: Assessment of Timeliness and Appropriateness of Corrective Actions

a. Inspection Scope

The inspectors selected an annual PI&R sample of five NRC findings in the past two years that had been assigned the cross-cutting aspect of P.1(d) ("The licensee takes appropriate corrective actions to address safety issues and adverse trends in a timely manner, commensurate with their safety significance and complexity") for further assessment using the performance attributes of Table 1 of IP 71152. NRC cross-cutting aspects are defined in NRC Inspection Manual Chapter 0310, "Components Within the Cross-cutting Areas." The assessment was primarily focused on the appropriateness and timeliness of the specified corrective actions for the issues identified during the past two years at Millstone Station. These findings consisted of:

1. Green NCV 05000423/2011003-01, "Failure to Take Timely Corrective Actions for Dealloying of Aluminum Bronze Service Water Valves"
2. Green NCV 0500336/2011003-02, "Untimely Corrective Action for Safety Related Inverters Leads to Repetitive Out of Calibration Results"
3. Green NCV 0500336/2011003-03, "Inadequate Corrective Action Results in Loss of Enclosure Building's Safety Function"
4. Green FIN 05000336/2010004-01, "Failure to Implement Timely Corrective Action for a Degraded FRV Results in Manual Reactor Trip"
5. Green FIN 05000423/2010003-03, "Unit 3 Reactor Trip Caused by Loss of Positive Control of Steam Generator Level"

In addition, the inspectors reviewed the following current issues to gain additional insights into the timeliness and appropriateness of implementation of corrective actions:

6. Implementation of corrective action plan for the Unplanned Power Excursion on February 12, 2011

7. Corrective action response to CR452946, "Turbine Driven AFW Pump Valve Room Exceeded EEQ Limits"

b. Findings and Observations

No findings were identified.

The inspectors observed that the implementation of corrective actions at Millstone has been inconsistent in regards to timeliness, effectiveness and appropriateness. While some corrective actions have been successful, there were other examples of corrective actions that have not been implemented in a timely or effective manner. Of the five Green NCV/FINs sampled, the effectiveness varied substantially. Findings 1 and 2 did not have robust or timely corrective actions that corrected the underlying issue that caused the finding. Findings 3, 4 and 5 had better success in implementing appropriate corrective actions to address the identified issue; however, the timeliness of implementation was problematic because these findings were repeat problems where previous corrective actions had been ineffective.

Issue 6 was addressed by a comprehensive Formal Self Assessment (SAR001631) in which the inspectors agreed with Dominion's conclusion that "in some cases the corrective actions are not specific, complete and/or have not been effective in improving operator performance." Issue 7 was selected as a real time case study of a recent CR to evaluate an adverse condition. Issue 7 was closed without fully implementing corrective actions to assess the impact of exceeding the TRM 3.7.14 temperature monitoring requirement on the valves in the TDAFW valve room.

As a result of findings 1-5, Dominion assessed the concern in Apparent Cause Evaluation (ACE) 18751, "Weaknesses in Timely and Appropriate Corrective Actions," dated July 14, 2011. This ACE provided Dominion's insights and conclusions into the cause and resolution of this issue. ACE 18751 addressed the accumulation of more than three NRC findings that listed P.1 (d) as the cross-cutting aspect and reported that the apparent cause of this condition was a weakness in accountability for the improper closure of corrective actions and the improper extension of corrective actions. The contributing cause was a weakness in the achievability of corrective action assignments. The corrective action plan recommended two corrective actions to address these causal factors. The apparent cause was addressed by implementing an additional requirement for a Corrective Action Owner Review (CAOR) for all level 1 and 2 ACE corrective actions. The contributing cause was addressed by organizing an interdisciplinary team of managers to develop guidance on developing achievable corrective action plans. Immediate compensatory actions took credit for providing staff briefings on evaluating the risk of extending corrective actions under a previous ACE. The scope of the investigation was comprehensive but the causal analysis and corrective actions appeared to be focused on a small subset of potential causal factors. It was not clear why the two causal factors were selected and why other potential causal factors were not selected as apparent and contributing causes. The ACE did not provide an analysis to explain why these specific areas would provide sufficient barriers to correct the identified problems when compared to the other potential causal factors identified in the ACE.

The Dominion CAP is a complex process for identifying, addressing and correcting issues. The program guidance document, PI-AA-200, "Corrective Actions," allows the practice of closing level 3 (the vast majority) of CRs to the work management process which includes non-CAP tracking systems such as Requests for Engineering Assistance (REAs), action requests (ARs) and work orders (WOs). This practice introduces a system interface that can be the source of some confusion if the intent of the corrective actions specified in the CR is changed during the translation into the work management system. This practice has resulted in some examples of corrective actions being inadvertently cancelled or the intent changed because the work management process does not provide the context, reason or requirement for the completion of the corrective action. Level 1 and 2 CAs (those with the greatest significance) cannot be closed to the work management system. Tracking individual issues from identification to effective correction can require extensive research effort and specific expertise to use the Condition Report System (CRS) software application for the database.

Dominion's performance in implementing timely and appropriate corrective actions that address safety issues and adverse trends has been inconsistent over the assessment period. The complexity of the CRS tracking system, the large number of CRs and CAs, the accountability of the line management to implement the CAs, and the difficulty in structuring corrective actions that were achievable with the resources provided has created barriers to successful and timely implementation of corrective actions.

.4 Annual Sample: 35th Year Inspection of the Containment Structure

a. Inspection Scope

The inspectors performed an in-depth review of Dominion's 35th year inspection of the containment structure in order to assess the impact of high water levels in the tendon access gallery identified in CR374859. The inspectors reviewed the Tendon Surveillance Report and the work order for the inspection of the concrete structure and compared them to the ASME Section XI requirements for Class CC Concrete Components of Light-Water Cooled Plants. The inspectors also reviewed program health reports, CRs, and interviewed the program engineer in order to determine if problems were being entered into the corrective action program at the appropriate level.

b. Findings and Observations

No findings were identified.

Six additional hoop tendons were inspected due to the high water levels in the tendon access gallery that occurred earlier in the year. No evidence of water or deterioration of the tendons was identified. The inspectors verified that the tendon inspection and concrete inspection met the requirements of ASME Section XI. Deficiencies identified in the inspections were entered into the corrective action program.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153)

.1 (Closed) Licensee Event Report (LER) 05000336/2011-003-00 Completion of a Plant Shutdown Required by Plant Technical Specifications

On September 3, 2011, Dominion declared the Unit 2 'A' train SW loop inoperable when leakage from a degraded SW spool piece increased beyond pre-established limits. Technical Specification 3.7.4.1 requires that with one SW loop inoperable, restore the inoperable loop to operable status within 72 hours or be in cold shutdown within the next 36 hours. Since the leak was unisolable, the plant was shutdown. The inspectors did not identify any new issues during the review of the LER. This LER is closed.

.2 (Closed) Licensee Event Report (LER) 05000336/2011-004-00 Reactor Trip Circuit Breaker Testing not in Compliance with Technical Specifications

On September 14, 2011, Dominion discovered that surveillance procedure SP 2401D, "RPS Matrix Logic and Trip Path Testing," specified that the reactor trip circuit breakers (TCBs) be closed. This placed Millstone Unit 2 in an applicable mode prior to completing a surveillance test demonstrating that the TCBs were operable. A review of plant start-ups determined that on July 24, 2009, the TCBs were closed rendering the control element assembly (CEA) drive system capable of CEA withdrawal without first demonstrating that the TCBs were operable. This is contrary to the requirements of Technical Specification 4.0.4. The enforcement aspects of this issue are discussed in Section 4OA7. The inspectors did not identify any new issues. This LER is closed.

.3 (Closed) Licensee Event Report (LER) 05000423/2011-002-00 Failure of Two Main Steam Safety Valves to Lift Within the Acceptance Criteria

On October 6, 2011, Unit 3 was at 100 percent power conducting main steam safety valve (MSSV) set pressure testing. Two of the 20 MSSV valves, 3MSS*RV23B and 3MSS*RV22D, failed to lift within their +/- 3 percent acceptance criteria as required by Technical Specification 3.7.1.1. The valves lifted 3.05 percent and 4.8 percent above their setpoint. Both valves were successfully retested. The average lift pressure of all 20 MSSVs was much less than the 3 percent limit. The MSSVs would have provided adequate pressure relief in a design basis event. Therefore, the failure to comply with TS 3.7.1.1 constitutes a violation of minor significance that is not subject to enforcement action in accordance with the NRC's Enforcement Policy. The inspectors did not identify any new issues during the review of the LER. This LER is closed.

4OA6 Meetings, Including Exit

On January 11, 2012, the inspectors presented the inspection results to Stephen E. Scace, Site Vice President, and other members of the Millstone staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by Dominion and is a violation of NRC requirements, which meets the criteria of the NRC Enforcement Policy for being dispositioned as an NCV.

Technical Specification 4.0.4 states, in part, that entry into an operational Mode shall not be made unless the surveillance requirement(s) associated with the limiting condition for operation has been performed within the stated surveillance interval. Contrary to the above, while performing RPS matrix and trip path testing during the Unit 2 start-up on July 24, 2009, Dominion closed the TCBs and rendered the CEA drive system capable of CEA withdrawal without first demonstrating that the TCBs were operable. Dominion entered this issue into their corrective action program (CR442964) and is revising the surveillance procedure. This violation is of very low safety significance because the performance of the surveillance verified the operability of the TCBs.

**ATTACHMENT: SUPPLEMENTARY INFORMATION**

## SUPPLEMENTAL INFORMATION

## KEY POINTS OF CONTACT

Licensee Personnel

| | |
|---|---|
| L. Armstrong | Manager, Training |
| R. Acquaro | Unit 3 Shift Manager |
| G. Auria | Nuclear Chemistry Supervisor |
| B. Barron | Manager, Nuclear Oversight |
| B. Bartron | Supervisor, Licensing |
| E. Brodeur | Unit 3 Shift Manager |
| D. Burley | Unit 3 Unit Supervisor and Test Coordinator, Unit 3 LOP Test |
| S. Cardoza | Assistant Supervisor I&C |
| C. Chapin | Assistant Operations Manager |
| C. Chapman | Unit 3 Unit Supervisor |
| W. Chestnut | Supervisor, Nuclear Shift Operations Unit 2 |
| F. Cietek | Nuclear Engineer, PRA |
| T. Cleary | Licensing Engineer |
| G. Closius | Licensing Engineer |
| J. Crepeau | Condensate System Engineer |
| L. Crone | Supervisor, Nuclear Chemistry |
| J. Curling | Manager, Protection Services |
| P. Dillon | Diesel Generator System Engineer |
| J. Dorosky | Health Physicist III |
| A. Elms | Manager of Nuclear Organizational Effectiveness |
| M. Finnegan | Supervisor, Health Physics, ISFSI |
| J. Fuller | Senior Training Instructor |
| A. Gharakhanian | Nuclear Engineer III |
| W. Gorman | Supervisor, Instrumentation & Control |
| M. Graves | ILRT Test Coordinator |
| C. Grisafe | Technical Specialist II |
| J. Grogan | Assistant Operations Manager |
| K. Grover | Manager, Nuclear Operations |
| M. Hollis | Unit 3 Unit Supervisor |
| C. Houska | I&C Technician |
| B. Kelly | Unit 3 Unit Supervisor |
| J. Kunze | Supervisor, Nuclear Operations Support |
| J. Laine | Manager, Radiation Protection/Chemistry |
| R. MacManus | Director, Nuclear Station Safety & Licensing |
| G. Marshall | Manager, Outage and Planning |
| H. McKenny | Operations Support |
| D. Mello | Unit 3 Plant Equipment Operator |
| D. Minich | Senior Training Instructor |
| A. Morse | Unit 3 Outage Coordinator |
| D. Reed | Unit 3 Shift Manager |
| R. Riley | Supervisor, Nuclear Shift Operations Unit 3 |
| C. Robertson | Supervisor I&C |
| M. Roche | Senior Nuclear Chemistry Technician |
| R. Royce | Senior Training Instructor |
| L. Salyards | Licensing, Nuclear Technology Specialist |

| | |
|---|---|
| M. Sartain | Director, Nuclear Engineering |
| S. Scace | Site Vice President |
| M. Sebilius | Unit 3 Control Room Operator |
| J. Semancik | Plant Manager |
| A. Smith | Asset Management |
| D. Smith | Manager, Emergency Preparedness |
| S. Smith | Manager, Engineering |
| P. Strickland | Senior Operations Manager, ESF Test |
| M. Strollo | Unit 3 Shift Technical Advisor |
| S. Turowski | Supervisor, Health Physics Technical Services |
| G. Van Wert | President, ILRT, Inc. (Contractor) |
| C. Vournazos | IT Specialist, Meteorological Data |

## LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Closed

| | | |
|---|---|---|
| 05000336/2011-003-00 | LER | Completion of a Plant Shutdown Required by Plant Technical Specifications (Section 4OA3) |
| 05000336/2011-004-00 | LER | Reactor Trip Breaker Testing not in Compliance with Technical Specifications (Section 4OA3) |
| 05000423/2011-002-00 | LER | Failure of Two Main Steam Safety Valves to Lift within the Acceptance Criteria (Section 4OA3) |

## LIST OF DOCUMENTS REVIEWED

### Section 1R01: Adverse Weather Protection

Procedures
C OP 200.13, "Cold Weather Preparations," Revision 003-04
OP 2326A, "Service Water System," Revision 023-07
OP 2331, "Plant Heating and Condensate Recovery System," Revision 006-09
OP 3322, "Auxiliary Feedwater System," Revision 021-03
OP 3340C, "Primary Grade Water System," Revision 016-00

Miscellaneous
CR447359
CR451639

### Section 1R04: Equipment Alignment

Procedures
OP 2326A-001, "Service Water Alignment Verification, Facility 1," Revision 000-06
OP 2326A-002, "Service Water Alignment Verification, Facility 2," Revision 000-05
OP 3305-001, "Fuel Pool Cooling System – Valve Lineup," Revision 005

OP 3310A-001, "Residual Heat Removal Common," Revision 007-02
OP 3310A-2, "Residual Heat Removal System Train 'A'," Revision 8CHG2
OP 3310A-003, "Residual Heat Removal System Train 'B'," Revision 009-02

Condition Reports
CR449015
CR456625

Miscellaneous
High Risk Contingency Plan for Service Water Spool SK912 Repair
Residual Heat Removal System Health Report 3rd quarter 2010 and 2011
25212-26912 Sheet 1, "Piping &Instrumentation Diagram Low Pressure Safety System," Revision 49

**Section 1R05: Fire Protection**

Miscellaneous
MNPS-3,"Fire Protection Evaluation Report," Revision 16
Millstone Unit 2 Firefighting Strategies, April 2002
Millstone Unit 2 Fire Hazards Analysis, Revision 11
Millstone Unit 3 Firefighting Strategies, April 2002

**Section 1R06: Flood Protection Measures**

Miscellaneous
Unit 3 Internal Flooding Evaluation
P(R) 1073, "Maximum Flood Levels and Effect on Safety Related Equipment in the Diesel Generator Building," Revision 0
GL 2007-01, "Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients"
NUSCO 171, "Individual Plant Examinations for Severe Accident Vulnerabilities," dated August 1990

**Section 1R08: In-service Inspection**

Examination Procedures
ER-AA-NDE-MT-200, ASME Section XI Magnetic Particle Examination Procedure, Revision 4
ER-AA-NDE-VT-604, Visual Examination for Leakage of PWR Reactor Head Penetrations, Revision 2
ER-AA-NDE-UT-801, Ultrasonic Examination of Ferritic Piping Welds in Accordance with ASME Section XI, Appendix VIII, Revision 1
ER-AA-NDE-UT-802, Ultrasonic Examination of Austenitic Piping Welds in Accordance with ASME Section XI, Appendix VIII, Revision 2
ER-AA-NDE-UT-806, Ultrasonic Examination of Reactor Pressure Vessel Welds in Accordance with ASME Section XI, Appendix VIII, Revision 0
ER-AP-BAC-10, Boric Acid Corrosion Control Program, Revision 8
ER-AP-BAC-101, Boric Acid Corrosion Control Program (BACCP) Inspections, Revision 7
ER-AP-BAC-102, Boric Acid Corrosion Control Program (BACCP) Evaluations, Revision 9
ER-AA-NDE-PT-301, Balance of Plant Liquid Penetrant Examination Procedure, Revision 3
ER-AA-ISI-100, Dominion In-service Inspection Program, Revision 3

ER-AA-RRM-100, ASME Section XI Repair/Replacement Program Fleet Implementation Requirements, Revision 4
ER-MP-NDE-UT-812-NPQR, Manual Phased Array Ultrasonic Examination of Reactor Pressure Vessel Welds, Revision 0
U3-24-SIP-REF01, Unit 3 Eddy Current Data Analysis Reference Manual, Revision 6

Work Orders
53102460129, Replacement of a portion of service water line 3-SWP-006-35-3A in control building enclosure tube

Drawings
25212-20900, Sheet 3 of 3, Millstone Nuclear Power Station-Unit 3 Reactor Vessel –Zone 002 Closure Head, Revision 3

Condition Reports
CR-437152
CR-437396
CR-437660
CR-437663
CR-440927
CR-446135
CR-446843
CR-447057
CR-447280
CR-447297
CR-447302
CR-447405
CR-448673
CR-448709
CR-448766
CR-448784
CR-448905
CR-448809
CR-449133
CR-449351
CR-449407

Miscellaneous
ETE-MP-2011-0109, Millstone Unit 3 Steam Generator Integrity Degradation Assessment (R14), Revision 0
M3-EV-10-0020, Millstone Unit 3 Steam Generator Condition Monitoring and Operational Assessment-Refueling Outage 13, Revision 1
Audit 11-07, In-service Inspection/In-service Testing, September 26, 2011

**Section 1R11: Licensed Operator Requalification Program**

Miscellaneous
Unit 2 LORT S11602, SIM#2
Unit 3 Simulator Exercise Controller Guide S11601L and S11602L, "Shutdown and Cooldown Outside the Control Room EOP3503 and EOP 3504," dated November 15, 2011
EOP 3503, "Shutdown Outside the Control Room," Revision 015
EOP 3504, "Cooldown Outside the Control Room," Revision 008-06

**Section 1R12: Maintenance Effectiveness**

Procedures
C SP 760, "Battery Discharge Test," Revision 003-04
SP 3712NC-001, "Vital Battery Charger Surveillance Load Testing," Revision 008

Condition Report
CR445935

Miscellaneous
Auxiliary Building Ventilation System Health Report 3rd Quarter 2010 and 2011
Auxiliary Building Ventilation System Unavailability November 2009 – September 2011
125 Volt DC System Health Report 3rd Quarter 2010 and 2011
125 Volt DC Unavailability September 2009 to August 2011

MRE011942
MRE011954
MRE011959
MRE011963
MRE011972
MRE012072
MRE012077
MRE012391
MRE012761
MRE012913
MRE014059
MRE014158
MRE014192

**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

Procedures
OP-MP-601, "Protected Equipment," Revision 6
OP 3216, "Reactor Coolant System Drain (ICCE)," Revision 010
OP 3260A, "Conduct of Outages," Revision 017-03
OU-M3-201, "Shutdown Safety Assessment Checklist," Revision 5

Condition Report
CR447093
CR447311
CR448228
CR450508
CR450599
CR451123
CR451911
CR455498

Miscellaneous
High Risk Contingency Plan for Repairs to Unit 2 'A' Circ Pump
Troubleshooting AWO 531022477259, Unit 3 Inverter 4
WO53M30516485, "Inspection, Cleaning and Power Factor Testing on 32D Load Center"
OD 000463, "Potential MP3 EDG overload at Tech Spec Frequency 60.8 Hz"
OP3646A.1, "Emergency Diesel Generator 'A' Operability Test," Revision 18-06
EOP 35 EAC-0.2, "Loss of All AC Power-Recovery with SI Required," Revision 012
Drawing 25121-39241 Sheet 190, Emergency Generator Long Term Loading [3EEGS*EG-A/B] for Scenario "Loss of Power CDA 1C – One Electrical Train Available, Large Steam or Feedwater Line Break," Revision 7
DNC Memorandum from Barrett Nichols to Andy Morse, Subject: Pre-3R14 Shutdown Risk Schedule Review," dated September

**Section 1R15: Operability Evaluations**

Procedures
SP 3622.3-005, "TDAFW Pump IST Comprehensive Pump and Check Valve Test," Revision 004-03

Condition Reports
CR449419
CR453357
CR456580

Miscellaneous
ER-AA-IST-PMP-101, Attachment 1, "IST Pump Reference Value Evaluation Form, for 3FWA*P2," dated November 16, 2011
ETE-CME-2011-1013
TRM 3.7.14 and Bases

**Section 1R18: Plant Modifications**

Procedures
TM 3-11-025, "Temporary Change to use a Non-seismically Qualified Neutron Detector for Channel 1 Source Range / Intermediate Range Instrument 3NMS*DET31," Revision 0
FSAR Change MP3-UCR-2011-016, "Table 3.10N1 Seismic Category 1 Instrumentation and Electrical Equipment in Westinghouse NSSS Scope of Supply"

Condition Reports
CR449415
CR449416
CR451012
CR451977
CR452050

Maintenance Orders/Work Orders
53102436841

Miscellaneous
EQR124.6C, Millstone Station Equipment Qualification Record for Valcor Model V70900-65-41 Solenoid Operated Valves
ETE-MP-2011-1056, "Main Steam Valve Building Steam Line Break – Support Information for Environmental Qualification of Feedwater Regulating Valves," Revision 0
11QN66-CC-01, "Certificate of Conformance for 6" Design ET with 667NNS Size 80 Valve Assembly," Revision A
ETE-MP-2011-1080

**Section 1R19: Post-Maintenance Testing**

Procedures
SP 3616A.1-002, "Stroke Time and Failure Mode Test of 3MSS*AOV31A, B, D, 3MSS*AOV65; Stoke Time Test of 3MSS*MOV17A, 'B' and 'D'," Revision 008-02
SP 3616A.1-011, "MSIV Remote Position Indication Verification," Revision 000-01
SP 2622.3-001, "TDAFW Pump Operational Readiness and Quarterly IST Group 'B' Pump Tests," Revision 014-04
SP 3622.3-003, "TDAFW Pump Time Response Test," Revision 008-02
SP 3622.3-008, "Refueling Test of TDAFW Steam Supply Non-Return Isolation Valves," Revision 000-03

Condition Reports

| | | |
|---|---|---|
| CR444455 | CR444981 | CR445878 |
| CR444556 | CR444984 | CR445936 |
| CR444569 | CR445184 | CR446198 |
| CR444574 | CR445314 | CR446957 |
| CR444576 | CR445402 | CR447269 |
| CR444583 | CR445412 | CR448164 |
| CR444630 | CR445516 | CR447555 |
| CR444633 | CR455544 | CR447564 |
| CR444713 | CR445637 | CR447635 |
| CR444759 | CR445645 | CR447733 |
| CR444765 | CR445664 | CR447804 |
| CR444772 | CR445668 | CR449444 |
| CR444888 | CR445700 | CR450632 |
| CR444918 | CR445779 | CR450731 |
| CR450881 | CR445809 | CR450732 |
| CR450931 | CR451798 | CR452946 |
| CR451019 | CR451834 | CR452953 |
| CR451100 | CR451961 | CR453009 |
| CR451106 | CR452139 | CR453509 |
| CR451176 | CR452777 | CR454610 |
| CR451213 | CR452883 | CR455638 |
| CR451394 | CR452896 | CR455693 |
| CR451573 | CR452923 | CR455734 |
| CR451651 | CR452924 | |
| CR456227 | CR452929 | |

Maintenance Orders/Work Orders

| | | |
|---|---|---|
| 53M30108758 | 53102464945 | 53102478082 |
| 53M30708338 | 53102465116 | 53102478126 |
| 53102336440 | 53102465126 | 53102478478 |
| 53102464780 | 53102465674 | 53102480261 |
| 53102464781 | 53102466369 | 53102483457 |
| 53102464798 | 53102466370 | 53102487854 |

**Section 1R20: Refueling and Other Outage Activities**

Procedures

AOP 3552, "Malfunction of the Rod drive System," Revision 011
AOP 3559, "Loss of Condenser Vacuum," Revision 009
OP 3202, "Reactor Startup (ICCE)," Revision 021-03
OP 3203, "Plant Startup," Revision 019-03
OP 3305, "Attachment 1, Fuel Pool Level Conversion to Elevation," Revision 021-05
SP 31008, "Low Power Physics Testing," Revision 004-01
LI-AA-700, "Fatigue Management and Work Hour Limits for Covered Workers," Revision 5

Condition Reports

| | | |
|---|---|---|
| CR437572 | CR448188 | CR451992 |
| CR437660 | CR448225 | CR452022 |
| CR440601 | CR448241 | CR452026 |
| CR441593 | CR448346 | CR452504 |
| CR443575 | CR448551 | CR452714 |
| CR444153 | CR448380 | CR452786 |
| CR445254 | CR448386 | CR452892 |
| CR445562 | CR449677 | CR452895 |
| CR446203 | CR450134 | CR452896 |
| CR446908 | CR450522 | CR452900 |
| CR446911 | CR450605 | CR452901 |
| CR447068 | CR450613 | CR452904 |
| CR447352 | CR450663 | CR452905 |
| CR447520 | CR450752 | CR452907 |
| CR447676 | CR450775 | CR452909 |
| CR447702 | CR451012 | CR452910 |
| CR447740 | CR451020 | CR452911 |
| CR447757 | CR451100 | CR452912 |
| CR447762 | CR451112 | CR452913 |
| CR444767 | CR451179 | CR452914 |
| CR444783 | CR451191 | CR452918 |
| CR447875 | CR451628 | CR452924 |
| CR448178 | CR451834 | CR453479 |
| CR448184 | CR451977 | |

Miscellaneous

EmpCenter Covered Workers' Work Schedules for Two Shift Managers, One Unit Supervisor, and One Reactor Operator, Unit 3 (outage schedule)

EmpCenter Covered Workers' Work Schedules for One Shift Manager, One Unit Supervisor, One Reactor Operator, Unit 2 (non-outage unit)

EmpCenter Covered Workers' Work Schedules for One Maintenance Supervisor and One Fire Brigade Leader (outage schedule)

Self Declaration for one security guard

Fatigue assessments for two security guards

NERF No. 2011067, "Reactor Protection systems (RPS) Trip per 10CFR50.72(b)(3)(iv)(A) (8 Hour Report)"

EN47461, "Manual Reactor Trip due to Loss of Condenser Vacuum During Startup," dated November 20, 2011

DNC Letter serial 11-610, "Subject: 10CFR55A Relief request IR-3-16, Temporary non-code Repair, Class 3 Reactor Plant Component Cooling Water System Pumps," dated November 10, 2011

DNC Memorandum from Barrett Nichols to Andy Morse, "Subject: Pre-3R14 Shutdown Risk Schedule Review," dated September 16, 2011

3R14 Outage Handbook, fall 2011, Millstone Power Station

3R14 WOs Deleted by Oscar (all except PMs and SVs) dated October 31, 2011

Manager Time Entry Reports for the period August 28 to November 7, 2011 for Dean Rowe, Todd Berger, James Kelly, Michael Sibilia, Cynthia Schrempp, James Hoagland, Todd Perkins, Eric Brodeur, Wayne Woolery, Stephen Cardoza

**Section 1R22: Surveillance Testing**

Procedures
SP3622.3, "Auxiliary Feedwater Pump 3FWA*P2 Operational Readiness Test," Revision 017-06
SP3622.3-001, "TDAFW Pump Operational Readiness and Quarterly IST Group 'B' Pump Tests," Revision 014-04
SP36.22.3-005, "TDAFW Pump IST Comprehensive Pump and Check Valve Test," Revision 004-02
SP 3646A.17, "Train 'A' ESF with LOP Test (ICCE)," Revision 017-05
Surveillance Form SP 3646A.17-001, "Train 'A' ESF with LOP Test," Revision 018-05
MP-24-APPJ-FAP01, "Integrated Leak Rate Test (ILRT) Process," Revision 000-01
VPROC ENG11-3-008, "Containment Integrated Leak Rate Test Type 'A' (ICCE) (ILRT-011-MP3 Rev. 0)," Revision 000-01

Condition Reports
CR446386
CR447080
CR447316
CR447320
CR450932
CR450993
CR451342
CR452777
CR452883
CR452896
CR452929
CR452946
CR455730

Miscellaneous
Drawing 25212-26930 Sheets 2 and 3, "Feedwater System," Revisions 43 and 24
LER 2010-004-00, "Inoperable Turbine Driven Auxiliary Feedwater Pump due to Degraded Relief Valve," dated October 19, 2010

**Section 2RS01; 2RS02; 2RS03; 2RS04: Radiological Hazard Assessment and Exposure Controls, Occupational ALARA Planning and Control, In-Plant Airborne Radioactivity Control and Mitigation, Occupational Dose Assessment**

Procedures
Radiological Hazard Assessment (71124.01)
RP-AA-106, Revision 1, Radiological Work Control Program
RP-AA-108, Revision 0, Radioactive Material Control Program
RP-AA-124, Revision 2, Dosimetry Discrepancy and ED Alarm
RP-AA-201, Revision 6, Access Controls for High and Very High Radiation Areas
RP-AA-221, Revision 0, Radiological Survey Records
RP-AA-222, Revision 0, Radiation Surveys
RP-AA-223, Revision 1, Contamination Surveys
RP-AA-225, Revision 3, Unrestricted Release of Material
RP-AA-226, Revision 0, Alpha Monitoring
RPM 2.1.1, Revision 8, Issuance and Control of RWPs
RPM 2.1.3, Revision 3, Identification and Control of High Radiological Risk Work

ALARA Planning & Controls (71124.02)
RP-AA-103, Revision 0, ALARA Program
RP-AA-103-1000, Revision 1, Station ALARA Committee
RP-AA-300, Revision 4, ALARA Review and Reports

RP-AA-301, Revision 1, ALARA Goals
RPM 1.4.2, Revision 2, ALARA Engineering Controls
RPM 1.4.4, Revision 3, Temporary Shielding
CP 3802J, Revision 4, Controlled Dissolution of Radiocobalt
CP 3802A, Revision 10, Primary Chemistry Control

In-Plant Airborne Radioactivity Control and Mitigation (71124.03)
RP-AA-107, Revision 1, Radioactive Contamination Control Program
RPM 2.4.3, Revision 5, DOP Testing of Portable HEPA Filtered Ventilation and Vacuum Units
RPM 2.10.2, Revision 12, Air Sample Counting and Analysis
RP-AA-224, Revision 0, Airborne Radioactivity Surveys
RPM 2.2.6, Revision 012, Continuous Air Monitors
RPM 2.3.1, Revision 007, Quantitative Respirator Fit Testing using TSI PortaCount
RPM 5.4.1, Revision 8, Issuance and Control of Respiratory Protection
MP-19-RSP-PRG, Revision 4, Respiratory Protection
RPM-2.3.11, Revision 001, Operation of Respirator Wash Systems

Occupational Dose Assessment (71124.04)
RP-AA-104, Revision 0, Internal Radiation Exposure Control
RP-AA-105, Revision 0, External Radiation Exposure Control Program
RP-AA-123, Revision 1, Effective Dose Equivalent
RP-AA-150, Revision 1, TLD Performance Testing
RPM 1.3.8, Revision 9, Criteria for Dosimetry Issue
RPM 1.3.13, Revision 10, Bioassay Sampling and Analysis
RPM 1.3.14, Revision 8, Personnel Dose Calculations and Assessments
RPM 1.6.4, Revision 5, Electronic Dosimetry System
RPM 2.5.8, Revision 3, Stay Time Tracking and Multi-Badging for Special Work
RPM 2.1.1, Revision 8, Issuance and Control of RWPs

ALARA Plans (AP) Reviewed
AP 3-11-01, Rx Disassembly/Assembly
AP 3-11-02, SG Secondary
AP 3-11-09, Mechanical
AP 3-11-11, Valve Testing & Repair
AP 3-11-13, Scaffolding
AP 3-11-14, Insulation

Condition Reports
424507, 424514, 423437,448025, 446940, 447222, 447378, 447584, 447943, 448363, 448367, 448305, 448780, and 448775

Self Assessment Reports
Informal Self Assessment Report SAR001482 Alpha Monitoring Program - June 30, 2011
Area for Improvement AFI Number 11-015-M South Saddle Decontamination June 9, 2011
Assessment No. 11-28-M Dose Control and Reduction Contamination and Radioactive Material Control - June 28, 2011
Nuclear Oversight Quarterly Report Second Quarter 2011

Site ALARA Council Meeting Minutes
3R14 Dose Goal Approval dated August 19, 2011
Micro Therm Insulation Dose Goal Approval October 15, 2011

Miscellaneous Documents
Electronic Dosimeter Dose/Dose Rate Alarm Reports, April – October 2011
Top Ten Individual Exposure Records for 2011
Portable HEPA Inventory and Test Records
EPRI Standard Radiation Monitoring Program Data Summary for Unit 3 Loop Locations
Unit 3 Reactor Coolant Radionuclide Concentrations prior and during 3R14
Bob McDonald to Eric Laine RE: Zinc Injection at Millstone 2 dated January 31, 2011
Analysis Calculation Number RP-08-06 approved July 28, 2008
Analysis Calculation Number RP-11-12 approved on July 7, 2011
Analysis Calculation Number RP-11-01 approved on March 24, 2011
Melanie Wong to David Christian RE: Kewaunee Power Station, Millstone Power Station, North Anna Power Station and Surry Power Station – Application to Use Weighting Factors for External Exposure

3R14 Work-In-Progress (WIP) Reviews
AP 3-11-01, Reactor Disassembly/Reassembly
AP 3-11-02, SG Secondary
AP 3-11-13, Scaffolding Installation/Removal, Installation of Permanent Scaffolding
AP 3-11-14, Insulation Removal/Installation

**Section 4OA1: Performance Indicator Verification**

Miscellaneous
Millstone Unit 2 LER 2010-003-00
Millstone Unit 2 LER 2011-001-00
Millstone Unit 2 LER 2011-002-00
Millstone Unit 2 LER 2011-003-00
Millstone Unit 3 LER 2010-004-00

**Section 4OA2: Problem Identification and Resolution**

Procedures
PI-AA-200-2002, "Effectiveness Reviews," Revision 4
PI-AA-200, "Corrective Action," Revision 17

Condition Reports

| | | |
|---|---|---|
| CR-08-03404 | CR431666 | CR428785 |
| CR352045 | CR433451 | CR434358 |
| CR352620 | CR435858 | CR452946 |
| CR374859 | CR437086 | CR453367 |
| CR403908 | CR445282 | CR455801 |
| CR413283 | CR452634 | CR456580 |
| CR429565 | CR456715 | CR457893 |

Drawings
ISI – Containment Program Health Report, 3rd Quarter 2010 and 2011
MS-N1064-500, "Final Report for the Millstone Unit 2 – 9th Period (35th Year) Tendon Surveillance," Revision 0

Miscellaneous
Corrective Action Program Trend Report, 3rd Quarter 2011
Millstone Power Station MPS OE, December 2010
ACE017393
ACE018751
ACE018894
ACE017509, "SENG-ACE: 3SWP*V696 has through wall weep (LTCA)," dated September 9, 2009
ACE018693, "Work Management issues with Corrective Action Plan from ACE 017509," dated
ACE018751, "Weakness in Timely and Appropriate Corrective Actions," dated 7/14/2011
EFR000255
RCE001043
RCE001044, "MP2 Unplanned 8% Power Excursion," dated April 8, 2011
SAR001631, "RCE0001044 Unplanned 8% Reactor Power Excursion at Millstone Unit 2,"

WO 53M20604153
WO 53102482756
WO 53102487963

MP-REA-28, "M2 Obsolescence Issues with MP2 Inverters"
MP-REA-539, "M2 Setpoint Change Required for Inverters"
MP-REA-904, "Enclosure Building Filtration System Capacity," dated March 3, 2011
MP-REA-911, "EBFS Bushing Arrangement," dated May 4, 2011
MP-REA-921, "MP3 Dealloying SW Valve Replacements," dated June 1, 2001
Memo from Manager of Design Engineering to CARB dated August 9, 2010 Subject: LTCA due Date Extension Request

## LIST OF ACRONYMS

| | |
|---|---|
| AC | alternating current |
| ADAMS | Agencywide Documents Access and Management System |
| ALARA | as low as reasonably achievable |
| AMSE | American Society of Mechanical Engineers |
| AP | ALARA Plans |
| BACCP | boric acid corrosion control program |
| CEDE | committed effective does equivalent |
| CFR | Code of Federal Regulations |
| CR | condition report |
| DAC | derived air concentration |
| DPW | declared pregnant worker |
| ECT | eddy current testing |
| EDE | effective does equivalent |
| EDG | emergency diesel generator |
| EP | emergency preparedness |
| HEPA | high efficiency particulate air |
| HP | health physicist |
| ISI | in-service inspection |
| IMC | Inspection Manual Chapter |
| INPO | Institute of Nuclear Power Operations |
| KV | kilovolt |
| LER | licensee event report |
| LHRA | locked high radiation areas |
| NCV | non-cited violation |
| NDE | non-destructive examination |
| NEI | Nuclear Energy Institute |
| NRC | Nuclear Regulatory Commission |
| OOS | out of service |
| PARS | Publicly Available Records |
| PI | performance indicator |
| RBC | reactor building containment |
| RCA | radiological controlled area |
| RCP | reactor coolant pump |
| RCS | reactor coolant system |
| RWP | radiation work permit |
| SDP | Significance Determination Process |
| SG | steam generator |
| SW | service water |
| TEDE | total effective does equivalent |
| TLD | thermoluminescent dosimeter |
| UFSAR | Updated Final Safety Analysis Report |
| URI | unresolved item |
| UT | ultrasonic test |
| VHRA | very high radiation area |

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 23, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Nuclear Connecticut, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060

SUBJECT: MILLSTONE POWER STATION, UNIT NOS. 2 AND 3--BRANCH CHIEF REASSIGNMENT IN THE OFFICE OF NUCLEAR REACTOR REGULATION

Dear Mr. Heacock:

This letter is to inform you that effective January 17, 2012, Ms. Meena Khanna has been assigned as the U.S. Nuclear Regulatory Commission's Branch Chief of Plant Licensing Branch I-2, Office of Nuclear Reactor Regulation. This branch has licensing oversight responsibility for Millstone Power Station, Unit Nos. 2 and 3. Ms. Khanna assumes all licensing oversight and supervisory duties previously held by Mr. Harold Chernoff. Ms. Khanna may be reached at 301-415-2150 or via e-mail at meena.khanna@nrc.gov.

Sincerely,

Louise Lund, Deputy Director
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-336 and 50-423

cc: Distribution via Listserv

January 23, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Nuclear Connecticut, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060

SUBJECT: MILLSTONE POWER STATION, UNIT NOS. 2 AND 3 – BRANCH CHIEF REASSIGNMENT IN THE OFFICE OF NUCLEAR REACTOR REGULATION

Dear Mr. Heacock:

This letter is to inform you that effective January 17, 2012, Ms. Meena Khanna has been assigned as the U.S. Nuclear Regulatory Commission's Branch Chief of Plant Licensing Branch I-2, Office of Nuclear Reactor Regulation. This branch has licensing oversight responsibility for Millstone Power Station, Unit Nos. 2 and 3. Ms. Khanna assumes all licensing oversight and supervisory duties previously held by Mr. Harold Chernoff. Ms. Khanna may be reached at 301-415-2150 or via e-mail at meena.khanna@nrc.gov.

Sincerely,

/RA/

Louise Lund, Deputy Director
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-336 and 50-423

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February 1, 2012

MEMORANDUM TO: Meena Khanna, Chief
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

FROM: John Hughey, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

SUBJECT: FORTHCOMING PRE-APPLICATION MEETING WITH DOMINION NUCLEAR CONNECTICUT, INC., TO DISCUSS A PROPOSED MILLSTONE POWER STATION, UNIT 2, LICENSE AMENDMENT REQUEST CONCERNING SPENT FUEL POOL CRITICALITY RE-ANALYSIS

DATE & TIME: Wednesday, February 15, 2012
10:00 a.m. – 12:00 p.m.

LOCATION: U.S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike, Room O4B06
Rockville, Maryland

PURPOSE: The purpose of the pre-application meeting between Dominion Nuclear Connecticut, Inc. (Dominion, the licensee), and the U.S. Nuclear Regulatory Commission (NRC), Office of Nuclear Reactor Regulation (NRR) staff is to discuss a potential license amendment request from Millstone, Unit 2, concerning spent fuel pool criticality re-analysis.

CATEGORY 1:* This is a Category 1 Meeting. The public is invited to observe this meeting and will have one or more opportunities to communicate with the Nuclear Regulatory Commission (NRC) after the business portion, but before the meeting is adjourned.

MEETING CONTACT: John Hughey
(301) 415-3204
john.hughey@nrc.gov

* Commission Policy Statement on "Enhancing Public Participation in NRC Meetings," (67 FR 36920) May 28, 2002.

PARTICIPANTS: Participants from the NRC include members of NRR.

| NRC | Dominion |
|---|---|
| C. Sanders | William Barton |
| J. Hughey | Tom Schleicher |
| J. Whited | John Guerci |
| K. Wood | Rich MacManus |
| M. Khanna | Bob Hall |
| | Wanda Craft |

Interested members of the public can participate in this meeting in person or via a toll-free audio teleconference. Please call the meeting contact listed above prior to the meeting to obtain the telephone number and the pass code.

The NRC provides reasonable accommodation to individuals with disabilities where appropriate. If you need a reasonable accommodation to participate in a meeting, or need a meeting notice or a transcript or other information from a meeting in another format (e.g., Braille, large print), please notify the NRC's meeting contact. Determinations on requests for reasonable accommodation will be made on a case-by-case basis.

To receive a summary of this meeting and begin receiving other plant-specific e-mail distributions, you must subscribe to the Operating Reactor Correspondence electronic distribution for this plant via http://www.nrc.gov/public-involve/listserver/plants-by-region.html. Once subscribed, if you wish to discontinue receiving electronic distribution, you may unsubscribe at any time by visiting the same web address above.

Docket No. 50-336

Enclosure:
Agenda

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AGENDA

NUCLEAR REGULATORY COMMISSION AND DOMINION MEETING TO DISCUSS

PROPOSED LICENSE AMENDMENT REQUEST CONCERNING

SPENT FUEL POOL CRITICALITY RE-ANALYSIS

MILLSTONE POWER STATION, UNIT 2

Wednesday, February 15, 2012

10:00 a.m. – 12:00 p.m. EST

- Introduction - All
- Discuss the proposed license amendment request concerning spent fuel pool criticality re-analysis.
- Public comment
- Adjourn

Enclosure

PARTICIPANTS: Participants from the NRC include members of NRR.

| NRC | Dominion |
|---|---|
| C. Sanders | William Barton |
| J. Hughey | Tom Schleicher |
| J. Whited | John Guerci |
| K. Wood | Rich MacManus |
| M. Khanna | Bob Hall |
| | Wanda Craft |

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To receive a summary of this meeting and begin receiving other plant-specific e-mail distributions, you must subscribe to the Operating Reactor Correspondence electronic distribution for this plant via http://www.nrc.gov/public-involve/listserver/plants-by-region.html. Once subscribed, if you wish to discontinue receiving electronic distribution, you may unsubscribe at any time by visiting the same web address above.

Docket No. 50-336

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| LChang, OEDO RI | RidsNrrDorLpll-2 Resource | RidsNrrPMMillstone Resource |
| RidsNrrAdro Resource | RidsOpaMail Resource | RidsOgcMailCenter Resource |
| JWhited, NRR | RidsRgnIMailCenter Resource | RidsAcrsAcnw_MailCTR Resource |
| RBellamy, RI | DScrenci, RI OPA | RidsNrrDeEicb Resource |
| Receptionist, OWFN/TWFN (paper copy) | | |

ADAMS Accession Number: ML120320028

| OFFICE | LPLI-2/PM | LPLI-2/PM | LPLI-2/LA | LPLI-2/BC |
|---|---|---|---|---|
| NAME | JWhited | JHughey | ABaxter | MKhanna |
| DATE | 2/1/12 | 2/1/12 | 2/1/12 | 2/1/12 |

**OFFICIAL RECORD COPY**

**NUCLEAR ENERGY ADVISORY COUNCIL**
**7:00 PM**
**April 19, 2012**
**RTM MEETING ROOM**
**WATERFORD TOWN HALL**
**15 ROPE FERRY ROAD**
**WATEFORD, CT**
**REGULAR MEETING**

**MINUTES**

**Members Present**

Mr. Bill Sheehan, Chair
Ms. Marge DeBold
Mr. Denny Hicks
Rep Kevin Ryan
Mr. Gregg Dixon

1. **Call to Order of Meeting**
   NEAC Chair Sheehan called the meeting to order at 7:03 PM at Waterford Town Hall, Waterford, CT.
   NEAC members and Nuclear Regulatory Commission (NRC) introduced themselves

2. **PROGRAM:**

   a) **Briefing on Millstone Power Station Annual Assessment by Mr. Ronald Bellemy, Branch Chief, DRP and Mr. Steve Shaffer, Senior Resident Inspector, MPS.**
   See attached enclosure for NRC presentation. When asked by NEAC the NRC stated that allegation submissions were at normal levels for an operating power station and the Safety Conscious Work Environment principles were being followed at MPS.

3. **Public Comment**
   There were no members of the public present to ask questions

4. **Approval of Minutes of December 8, 2011 NEAC meeting**
   No quorum of NEAC Members present to approve minutes

5. **No other business was conducted. CASE Study Recommendation Endorsement will be considered at next meeting.**

6. **Next Meeting Date and Time**
   The next NEAC meeting will be some time in July-September 2012 when convenient for Dominion to provide a tour of Millstone Power Station.

7. **Adjournment** – No adjournment since no quorum for formal meeting.

# Millstone Power Station
# Open House

## Millstone Power Station
## 2011 Annual Assessment
## Open House

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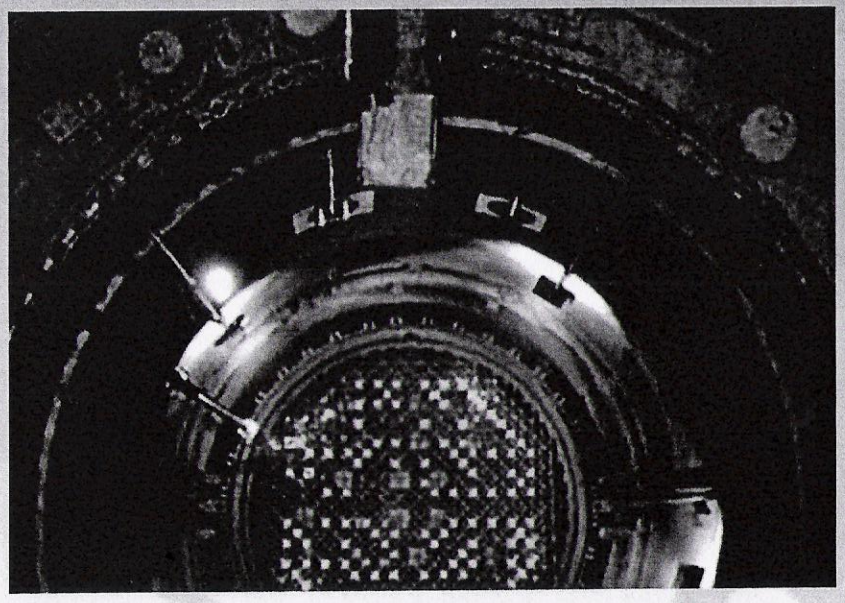
### 2011 Reactor Oversight Process
### Nuclear Regulatory Commission – Region I

# NRC Representatives

- Pete Wilson- Deputy Division Director, DRS
- Ronald Bellamy - Branch Chief, DRP
- George Wilson - Branch Chief, NRR
- Carleen Sanders- Senior Project Manager, NRR
- Steve Shaffer- Senior Resident Inspector
- Jo Ambrosini -Incoming Senior Resident Inspector
- Jim Krafty - Resident Inspector
- Brian Haagensen - Resident Inspector

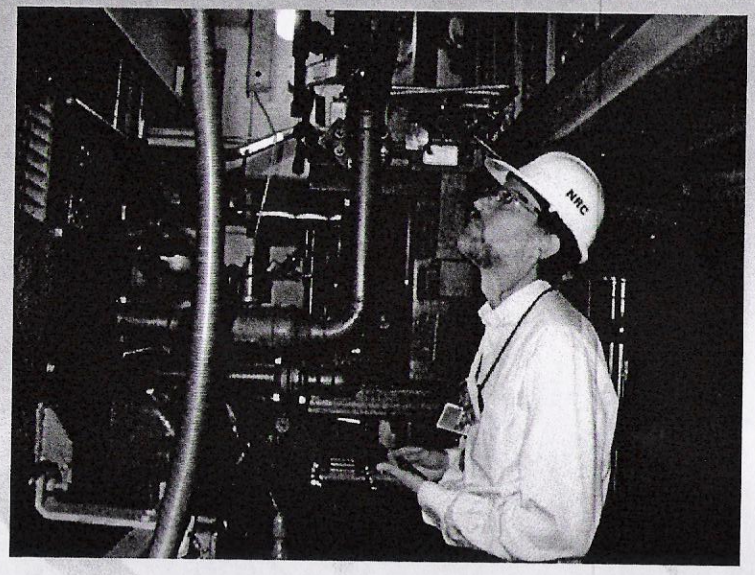
# Our Mission



- To license and regulate the nation's civilian use of byproduct, source, and special nuclear materials to ensure adequate protection of public health and safety, promote the common defense and security, and protect the environment.

# Inspection Activities in 2011

- 6446 hours of inspection and related activities at Millstone
- 3 resident inspectors on site – residents perform inspections daily and can respond to plant events at any time
- 2 major team inspections
  - Initial Operator Licensing Exams
  - U2 Operator Performance Special Inspection

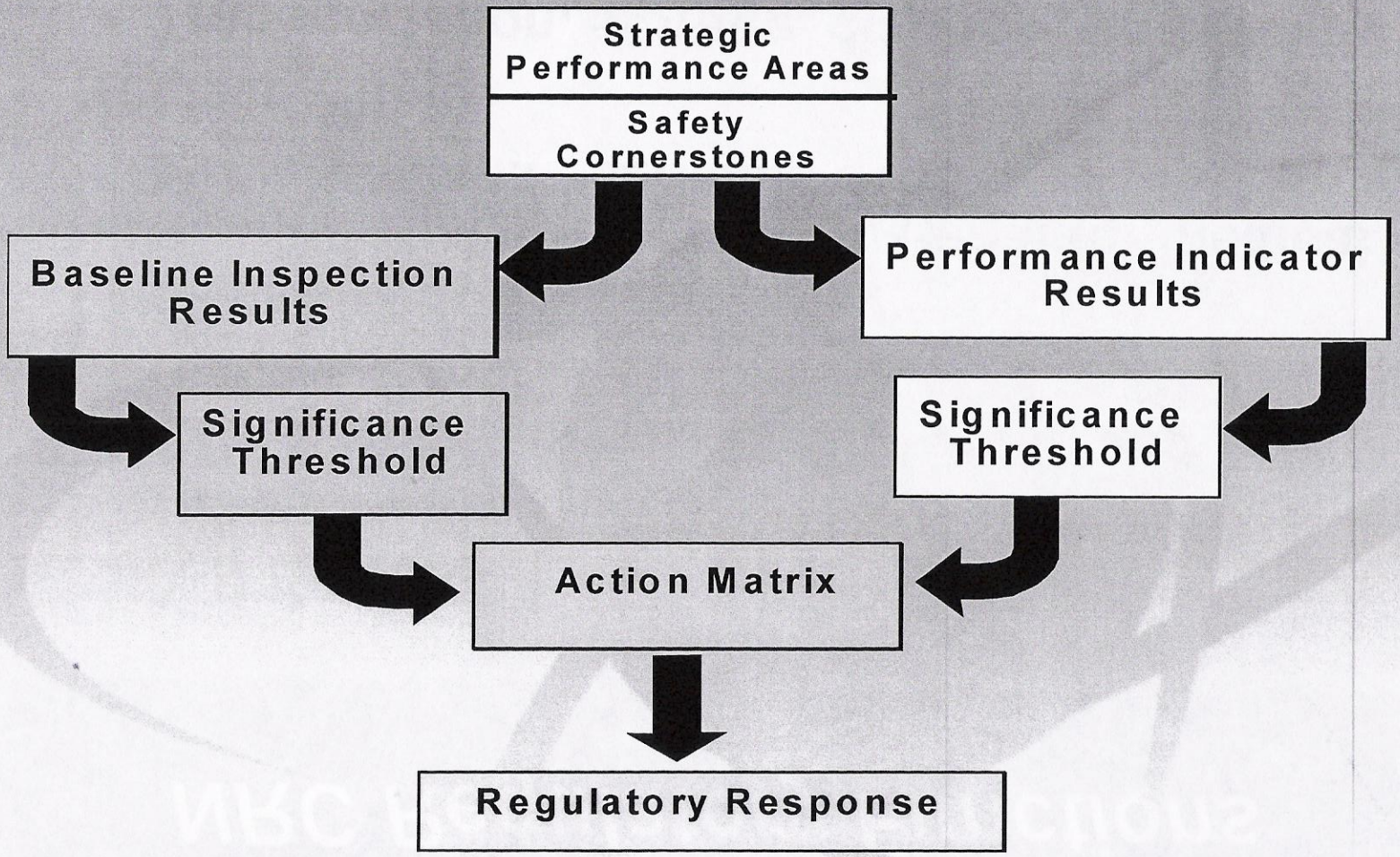


# NRC Regulatory Functions

**What We Regulate**

- Nuclear Reactors
  - Commercial power, research, test, and new reactor designs
- Nuclear Material
  - Reactor fuel, radioactive material for medical, industrial, and academic uses
- Nuclear Waste
  - Transportation, storage, disposal, and facility decommissioning
- Nuclear Security
  - Facility physical security

# Reactor Oversight Process



# Significance Threshold

**Performance Indicators**

**Green:** Only Baseline Inspection
**White:** Increases NRC oversight
**Yellow:** Increases NRC oversight
**Red:** Increases NRC oversight

**Inspection Findings**

**Green:** Very low safety issue
**White:** Low to moderate safety issue
**Yellow:** Substantial safety issue
**Red:** High safety issue

# Action Matrix Concept

| Licensee Response | Regulatory Response | Degraded Cornerstone | Multiple/Rep. Degraded Cornerstone | Unacceptable Performance |
|---|---|---|---|---|

**Increasing Safety Significance**

**Increasing NRC Inspection Efforts**

**Increasing NRC/Licensee Management Involvement**

**Increasing Regulatory Actions**

# NRC Assessment Summary

- Unit 2: Regulatory response column
  - White finding: inadequate reactivity management
  - NRC follow-up: Additional inspections, including a 95001 to review licensee's corrective actions
- Unit 3: Licensee response column
  - All Green PIs and Findings
  - NRC follow-up: Baseline inspections

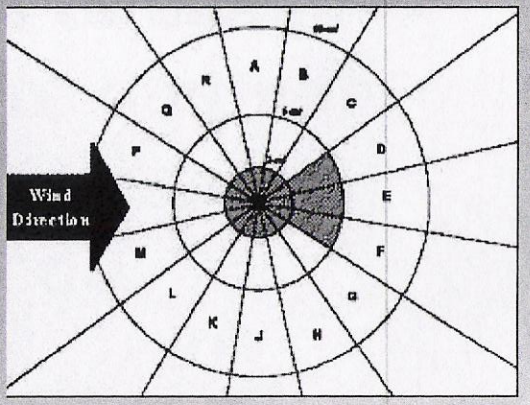
# Examples of Baseline Inspections

| | |
|---|---|
| • Equipment Alignment | ~80 hrs/yr |
| • Triennial Fire Protection | ~250 hrs every 3 yrs |
| • Operator Response | ~125 hrs/yr |
| • Emergency Preparedness | ~80 hrs/yr |
| • Rad Release Controls | ~110 hrs every 2 yrs |
| • Worker Radiation Protection | ~95 hrs/yr |
| • Corrective Action Program | ~250 hrs every 2 yrs |
| • Corrective Action Case Reviews | ~60 hrs/yr |

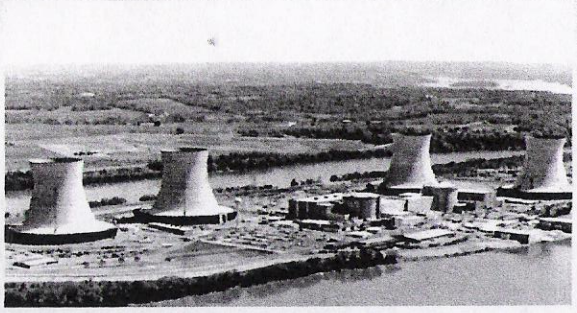
# Emergency Planning Zones

***Emergency planning is based on a range of accidents, including the most severe***

## Each nuclear plant has 2 Emergency Planning Zones



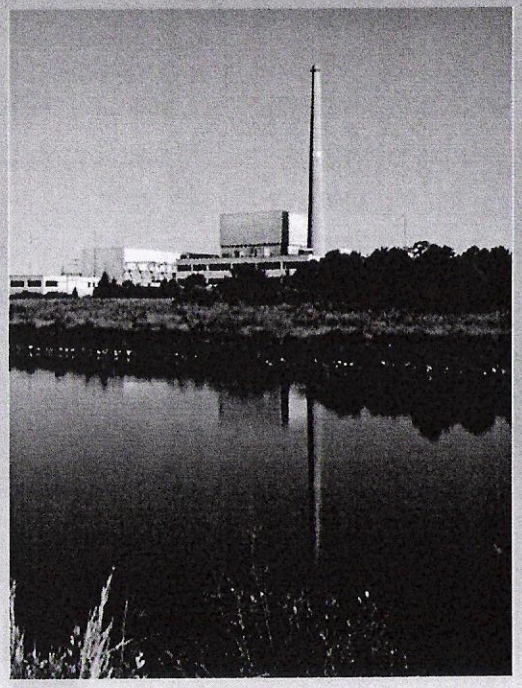

- 10 mile EPZ – Plume Exposure Planning Zone Focused on protecting people short-term
- 50 mile EPZ – Ingestion Exposure Planning Zone Focused on protecting people and the food supply long-term



## The EPZ:

- Encompasses area that would be most affected by reactor accidents
- Could be expanded if necessary – UNDER CONSIDERATION DUE TO FUKUSHIMA

# Response to Fukushima
# Current U.S. Plant Safety

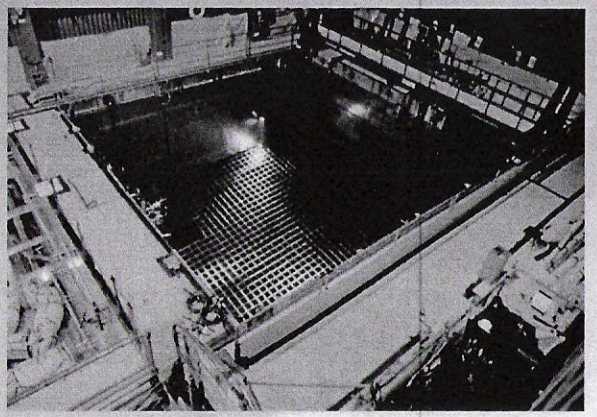


- Similar sequence of events unlikely in US
- Existing mitigation measures reduce the likelihood of core damage and radiological releases

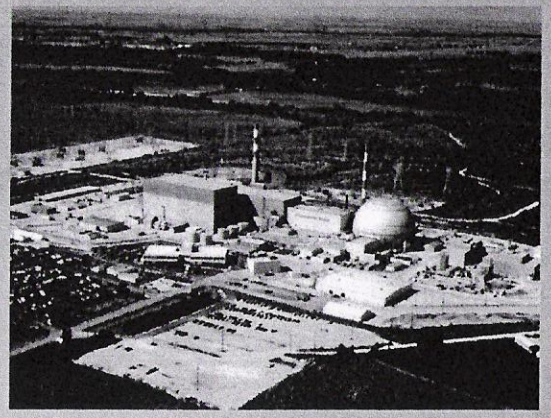
- No imminent risk from continued operation and licensing activities

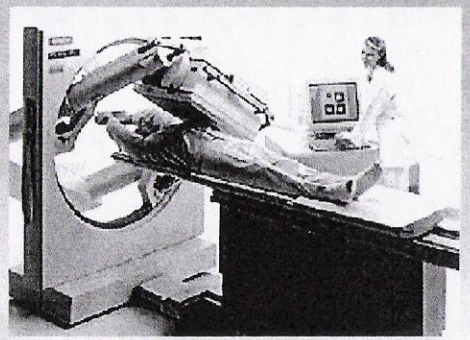
# Response to Fukushima Enhancements without Delay

- Reliable hardened vents for BWRs
- Re-evaluate external hazards
- Modify station blackout rule
- Mitigation strategies
- Enhance spent fuel pool instrumentation
- Enhance emergency plan staffing and communications



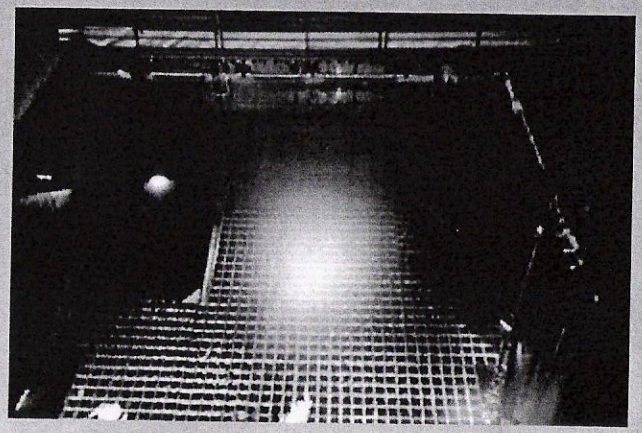
# Some Nuclear Facts

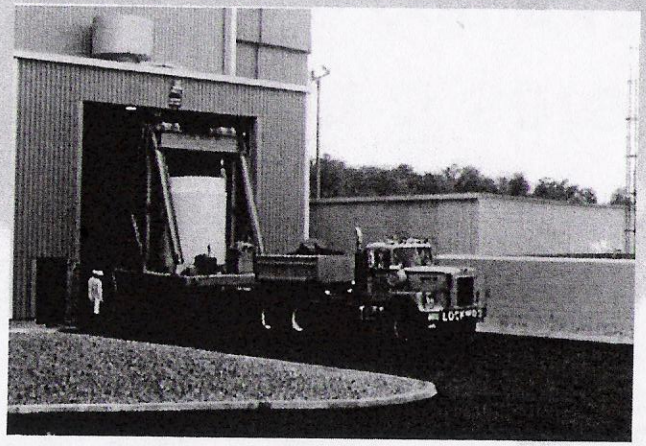




- More than 100 nuclear power plants supply about 20 percent of the electricity in the U.S.
- Nuclear materials are used in medicine for diagnosis and cancer treatment.
- Nuclear materials are widely used in industry, such as in density gauges, flow measurement devices, radiography devices, and irradiators.

# Nuclear Waste





- The NRC regulates:
  - Storage of spent reactor fuel in fuel pools or dry storage casks, and
  - Any national spent fuel storage site, such as the formerly proposed Yucca Mountain site.

# Contacting the NRC

- **Report a safety concern:**
  - **(800) 695-7403**
  - **Allegation@nrc.gov**
- **General information or questions:**
  - **www.nrc.gov**
  - **Public Affairs Officers:**
    - **Diane Screnci 610-337-5330**
    - **Neil Sheehan 610-337-5331**

**NUCLEAR ENERGY ADVISORY COUNCIL**

# 6:00 PM
# July 19, 2012
# TOWN HALL AUDITORIUM
# WATERFORD TOWN HALL
# WATERFORD, CT
# SPECIAL MEETING

**Minutes**

**Meeting followed a Tour of the Millstone Power Station which started at 2:30 PM at the Sillian Training Center, Millstone Power Station and a brief dinner in the Town Hall Auditorium starting at approximately 5:00 PM.**

**Members Present**

Mr. Bill Sheehan, Chair
Ms. Pearl Rathbun, Vice Chair
Ms. Marge DeBold
Mr. Tom Nebel
Mr.Robert Klancko
Mr. James Sherrard
Dr. Edward Wilds representing Commissioner Esty

1. **Call to Order**
   NEAC Chair Sheehan called the meeting to order at 6:03 PM at Waterford Town Hall, Waterford, CT.

2. **Approval of Minutes of February 2, 2012 NEAC meeting. Noting of Meeting Notes for April 19, 2012 meeting (no quorum).**
   Minutes of February 2, 2012 meeting approved (Klancko/Rathbun) and Meeting notes of April 19, 2012 meeting noted.

3. **PROGRAM:**
   a) **Update on Millstone Station Operations by Dominion Nuclear Connecticut Representatives**
      Mr. Richard MacManus, Director Nuclear Safety & Licensing and Mr. Kenneth Holt, Manager Nuclear Communications briefed NEAC and answered questions from the Council.

4. **Public Comment**
   No Public was present

5. **NRC Correspondence Received since February 2, 2012 meeting.**
   List of correspondence was noted. There were no questions from NEAC members.

6. **Approval of CASE Study Endorsement Letter and determination of who to address the endorsement.**
   Motion to approve (Klancko/Sherrard) Endorsement of selected recommendations was approved with one abstention (Dr. Wilds abstained because he was a member of the CASE study committee that drafted the report.)

7. **Next Meeting Topic, Date and Time (Currently scheduled for September 20, 2012 at 7:00 PM)**
   Council agreed that the next meeting would be on December 6, 2012 to review and approve the annual report.

8. **Adjournment**
9. Motion was made by Mr. Sherrard and seconded by Mr. Klancko to adjourn; no objections; unanimous vote in favor; meeting adjourned at 7:55 PM.

## NRC Correspondence Received Since Last NEAC Meeting

1. Notice of Consideration of Approval of Application Regarding proposed Acquisition and Opportunity for a Hearing – Millstone Power Station, Unit 3 dtd February 15, 2012
2. Millstone Power Station-NRC NRC Material Control and Accounting Program Inspection Report dtd February 17, 2012
3. Millstone Power Station Units 1 & 2 and Their Respective Independent Spent Fuel Storage Installations – Review of Dominion Fleet Quality Assurance Topical Report, Revision 11 dtd February 17, 2012
4. Millstone Power Station Units 1, 2and 3- Exemption From Certain Requirements of Title 10 of the Code of Federal Regulations Part 26 Work Hour Controls During Periods of Severe Weather Conditions dtd February 24, 2012
5. Millstone Power Station NRC Baseline Security Inspection Report dtd February 24, 2012
6. Annual Assessment Letter for Millstone Power Station Units 2 and 3 dtd March 5, 2012
7. Issuance of Order to Modify Licenses With Regard to Requirements for Mitigation Strategies for Beyond Design Basis External Events dtd March 12, 2012
8. Summary of February 15, 2012 Pre Application Meeting with Dominion Nuclear Connecticut to Discuss a Proposed MPS Unit 2 License Amendment Request Concerning Spent Fuel Criticality re-analysis dtd March 12, 2012
9. Request for Information pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1,2.3, and 9.3 of the near-term task force review of insights form the Fukushima Dai-ichi Accident dtd March 12, 2012
10. Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation dtd March 12, 2012
11. Millstone Power Station NRC Emergency Preparedness Annual Inspection Report dtd March 27, 2012
12. Millstone Power Station Unit 2 – Request for Additional Information Regarding Steam Generator Tube Inservice Inspection Report for End of Cycle 20 dtd March 29, 2012
13. Millstone Power Station- NRC Integrated Inspection Report dtd April 23, 2012

14. Millstone Power Station Units 2 & 3:  Supplemental Response to Bulletin 2005-02, “Emergency Preparedness and Response Actions for Security-based Events dtd May 2, 2012
15. Assessment Follow-up Letter for Millstone Power Station Unit 2 dtd May 9, 2012
16. Prioritization of Response Due Dates for Request for Information Regarding Flooding Hazard Reevaluations for Recommendation 2.1 of the Near-Term Task Force review of insights from the Fukushima Dai-ichi Accident dtd May 11, 2012
17. Millstone Power Station Unit 2 Review of the Core Operating Limits dtd May 22, 2012
18. NRC Investigation Report NO 1-2012-015 dtd June 4, 2012
19. Millstone Power Station Units 2 & 3 Review of 60 Day Response to Request for Information Regarding Recommendation 9.3 of the Near Term Task Force Related to the Fukushima Daiichi Nuclear Power Plant Accident dtd June 7, 2012
20. Request for threshold Determination under 10 CFR 50.800 –Proposed Merger Between CVPS and Gaz Metro Involving Minority Common Stock Ownership in Connecticut Yankee Atomic Company dtd June 15, 2012
21. Millstone Power Station Units 2 & 3 NRC Component Design Bases Inspection Report dtd June 20, 2012.
22. Millstone Power Station Units 2 & 3 Close out of Bulletin 2011-01 “Mitigating Strategies” dtd June 21,, 2012
23. Millstone Power Station Unit 2 – Environmental Assessment and Finding of No Significant Impact dtd June 27, 2012
24. Millstone Power Station Unit 3 – Notice of Consideration of Approval of Transfer of Facility Operating License Conforming Amendment and Opportunity for a Hearing dtd July 9, 2012
25. Millstone Power Station Unit 1 – NRC Inspection Report dtd July 6, 2012

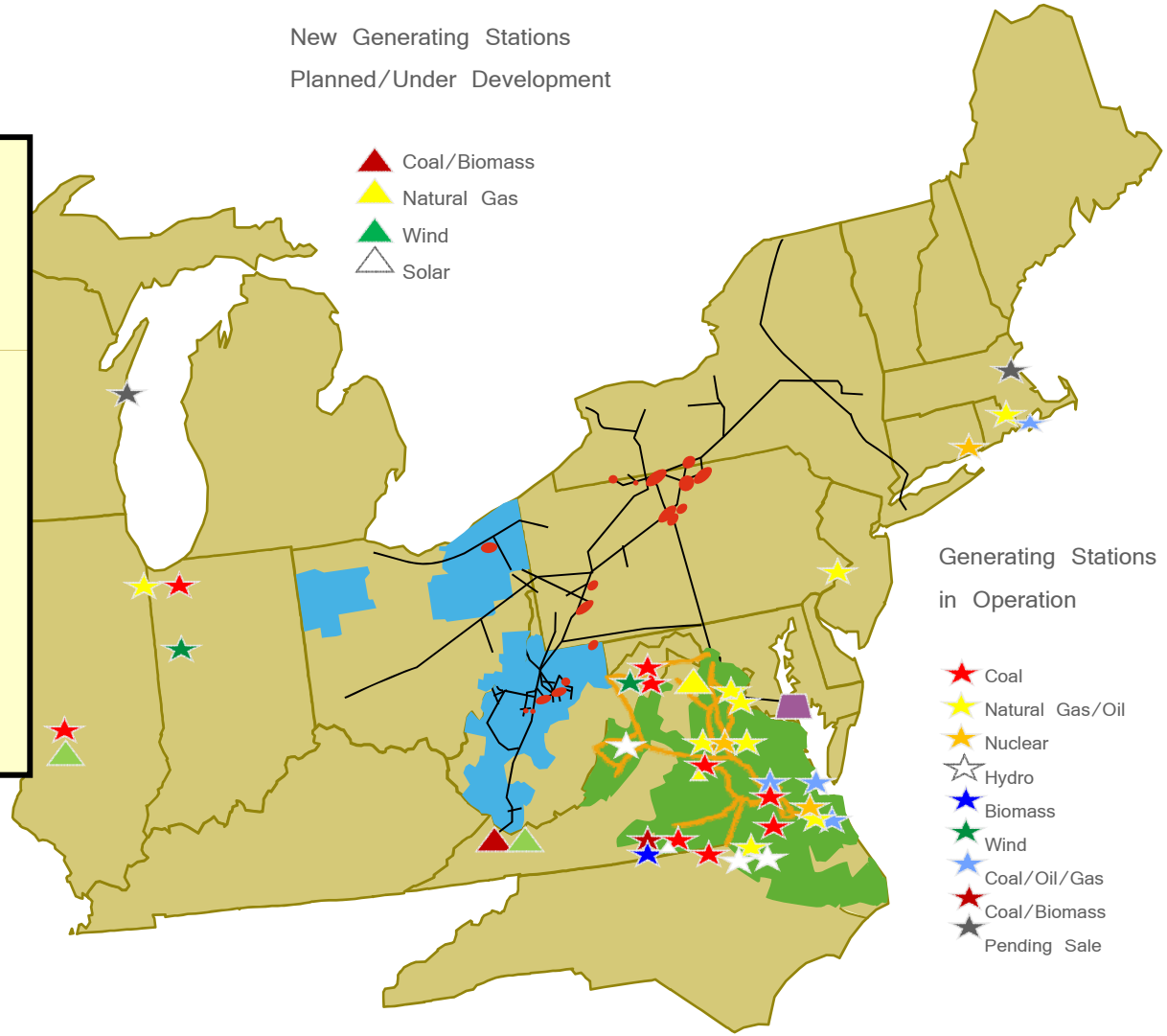
Dominion®

# Dominion Millstone/NEAC Update

July 19, 2012

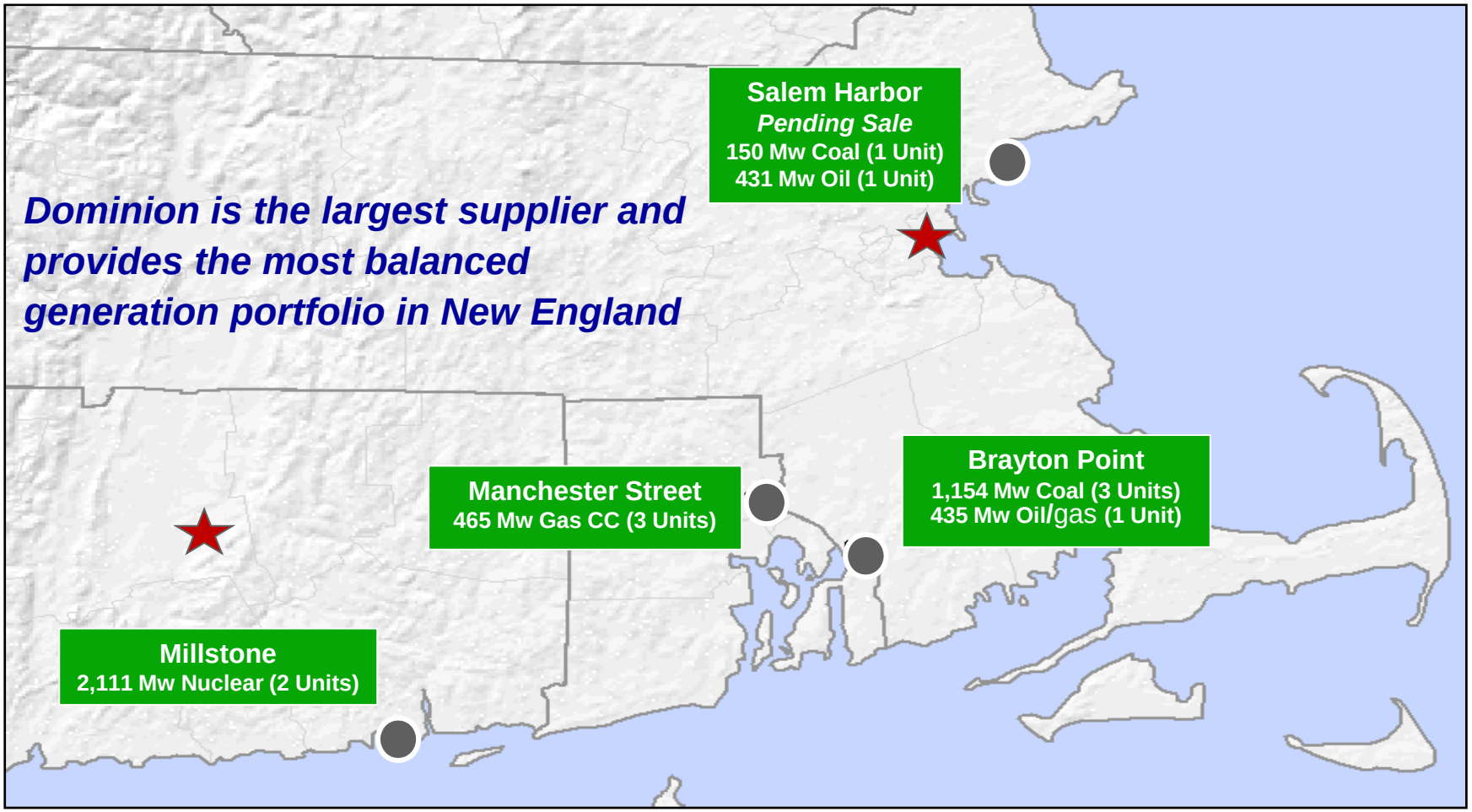
# Dominion's Footprint

- ~28,000 MW of electric generation
- 6,300 miles of electric transmission
- 11,000 miles of natural gas transmission, gathering and storage pipeline
- 947 billion cubic feet of natural gas storage operated
- Cove Point LNG Facility
- 2.4 million electric customers in VA and NC
- 1.3 million natural gas customers in OH & WV
- 2.2 million non-regulated retail customers in 15 states



# Dominion New England

## Generation Assets: 4,751 MW



# Millstone Overview

- Largest and most important generating facility in New England
- Located in Waterford on a 535 acre site - power station uses only approximately 50 acres
- 3 separate units:
  - Unit 1 - 660 Mw (1971) Permanently retired 1998
  - Unit 2 - 884 Mw (1975)
  - Unit 3 - 1227 Mw (1986)
- Dominion purchased Millstone in ‘01 for $1.3 Billion (largest single transaction in state’s history)
  - Since purchase, Dominion has invested more than $600 Million in reliability and safety upgrades
    - New Turbines
    - New Transformers
    - Variable Frequency Drives

# Millstone Status

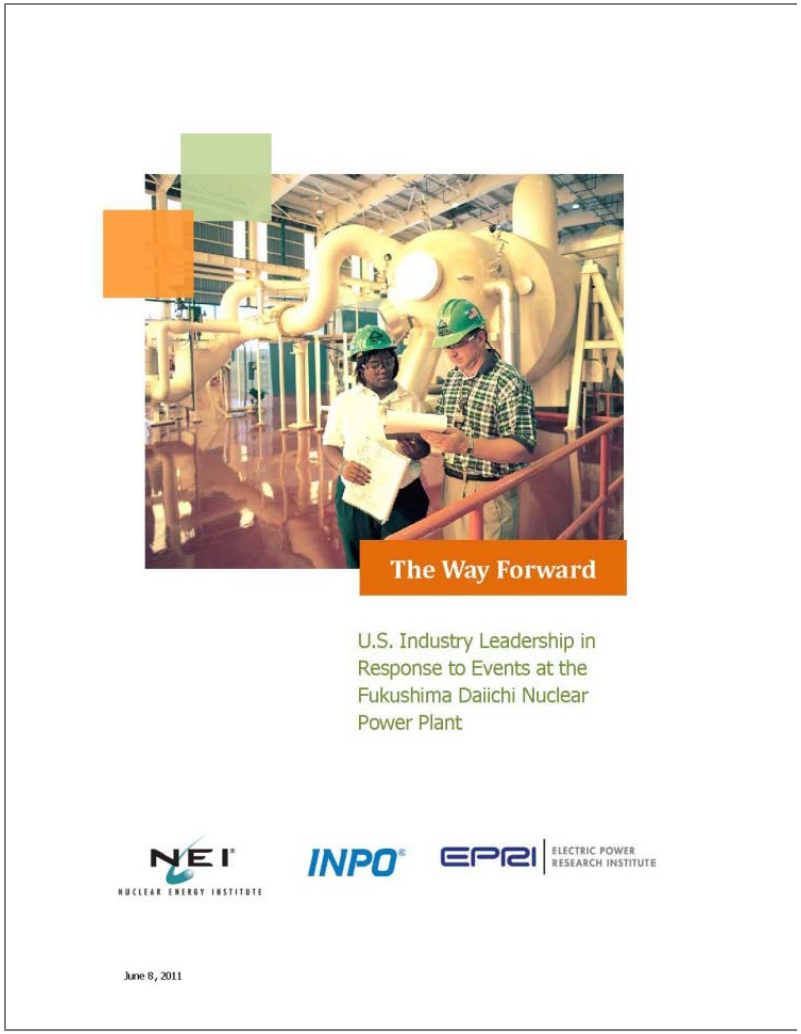
- **Millstone Unit 2**
  - 307 days online
  - 99.1% Capacity Factor YTD
- **Millstone Unit 3**
  - 240 days online
  - 100.9% Capacity Factor YTD
- 245 Days since last OSHA Recordable Injury
- 141 Days since last Human Performance Error
- Millstone Unit 2 begins refueling outage this fall

# Challenges

- Fukushima
- Legislative
- Regulatory

# Fukushima

- US Nuclear Industry Response:
  - Confirm safety of US reactors
    - Verify operability and usability of portable mitigation equipment already on-site
  - Establish communication focal point for industry
  - Establish factual basis for action based on understanding of the events in Japan




Source: NEI

# Dominion Response


# Fukushima

## Emergency Preparedness:

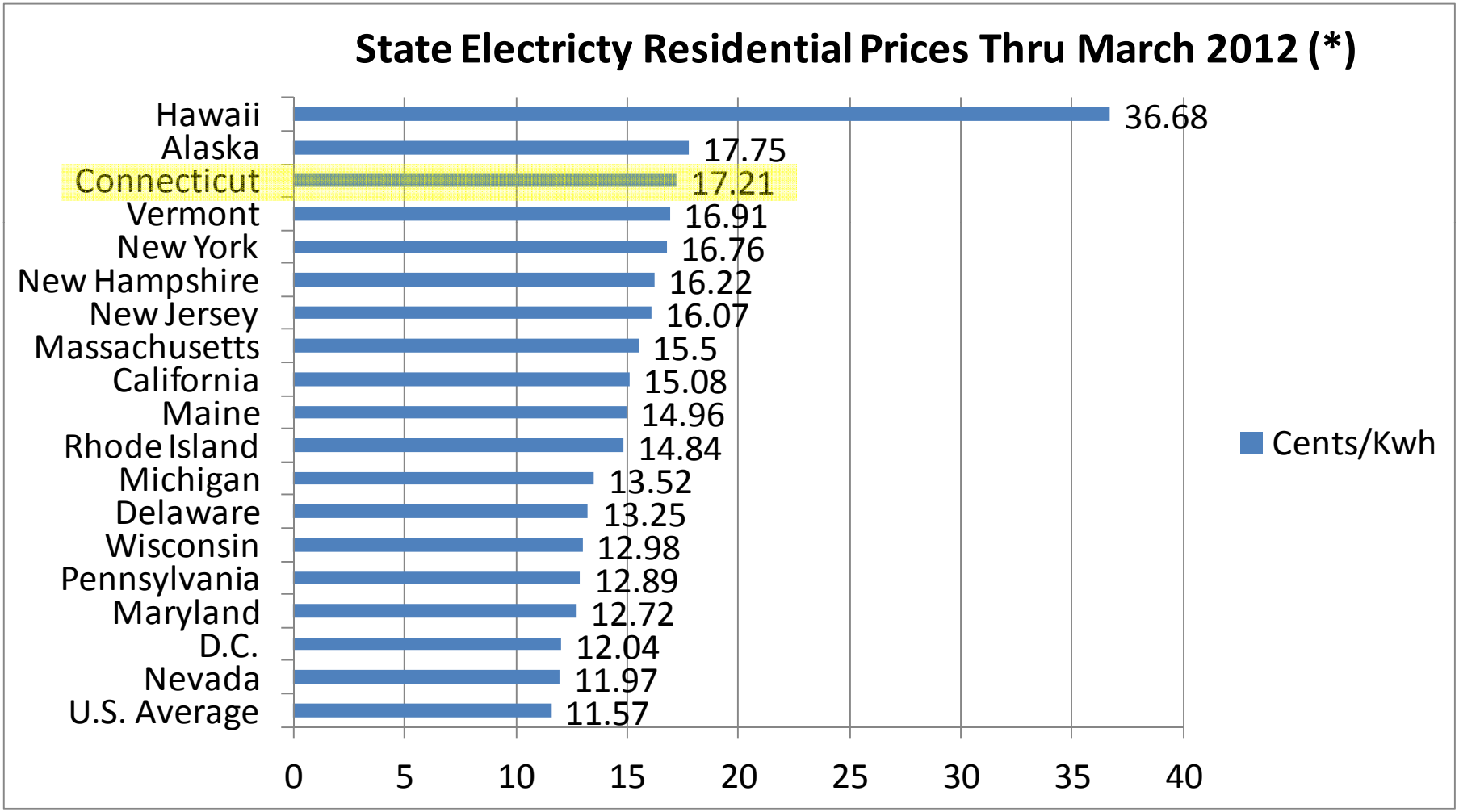
- NRC/Federal Emergency Management Agency (FEMA) evaluated exercise – August 2012
- Updated evacuation time estimate – completed by end of year
  - Performed every ten years in conjunction with new census data
- Participating in Governor Malloy's "Exercise and Planning Preparedness Initiative" at the request of the CT Division of Emergency Management and Homeland Security.

# Legislative Challenge

- **Millstone Legislative Challenges**:
  - State Tax Policy
    - SB 1176 – state production tax that would have taxed Millstone approximately $320 Million annually.
    - Governor's budget proposal passed with $70 Million production tax on electric generators – Millstone's annual portion is approximately $40 Million

# Legislative Challenges

- **Extension or increase of electric generator production tax:**




*http://www.eia.gov/electricity/monthly/pdf/epm.pdf

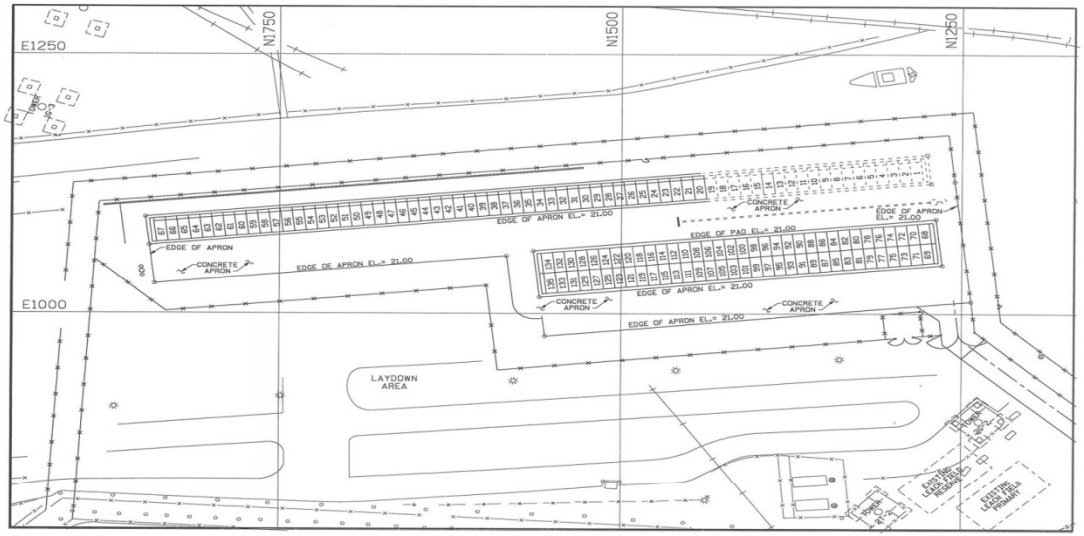
# Regulatory Challenges

- **Moving more fuel into dry cask storage**

# Regulatory Challenges

- **Application to CT Siting Council to expand concrete pad**

**Site of ISFSI and Expansion**



# Regulatory Challenges

- **Tentative Schedule**
  - Expansion of the facility is proposed in 2013
  - Additional HSMs are planned to be placed in the expanded facility in 2014
  - Next transfer of spent fuel from the spent fuel pools is planned for 2015

# Future Issues/Challenges

- **US EPA and state rulemaking on cooling water systems:**

# Points of Contact

- Richard MacManus
  **Director of Safety & Licensing**
  (860) 444-5377 Richard.MacManus@dom.com

- Kevin Hennessy
  **Director – Federal, State & Local Affairs – New England**
  (860) 444-5656 Kevin.R.Hennessy@dom.com

- Ken Holt
  **Manager of Communications – Millstone**
  (860) 440-0132 Kenneth.A.Holt@dom.com


For additional information, visit us at
**www.dom.com**

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 15, 2012

Mr. Dale A. Rocheleau
Senior Vice President, General Counsel
& Corporate Secretary
Central Vermont Public Service Corporation
77 Grove St.
Rutland, VT 05701

SUBJECT: NOTICE OF CONSIDERATION OF APPROVAL OF APPLICATION REGARDING PROPOSED ACQUISITION AND OPPORTUNITY FOR A HEARING – MILLSTONE POWER STATION, UNIT NO. 3 (TAC NO. ME7127)

Dear Mr. Rocheleau:

Enclosed is a copy of a "Notice of Consideration of Approval of Application Regarding Proposed Acquisition and Opportunity for a Hearing," related to the application dated September 9, 2011, as supplemented by letter dated November 4, 2011,[1] filed by Central Vermont Public Service Corporation (CVPS). The application, pursuant to 10 CFR 50.80, seeks U.S. Nuclear Regulatory Commission (NRC) approval of the proposed indirect transfer of the license to the extent effected by the proposed acquisition of CVPS by Gaz Métro Limited Partnership.

This notice is being forwarded to the Office of the Federal Register for publication.

Sincerely,

Carleen J. Sanders, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-423

Enclosure:
Notice

cc w/encl: see next page

[1] Agencywide Documents Access and Management System Accession Nos. ML11256A051 and ML11311A148, respectively.

Letter to Dale A. Rocheleau from Carleen J. Sanders dated February 15, 2012.

SUBJECT: NOTICE OF CONSIDERATION OF APPROVAL OF APPLICATION REGARDING PROPOSED ACQUISITION AND OPPORTUNITY FOR A HEARING – MILLSTONE POWER STATION, UNIT NO. 3 (TAC NO. 7127)

cc:

Daniel F. Stenger
Hogan Lovells US LLP
555 Thirteenth Street, NW
Washington, DC 20004

Thomas L. Cubbage, III
Covington & Burling LLP
1201 Pennsylvania Avenue, NW
Washington, DC 20004

Additional distribution via Listserv

7590-01-P

UNITED STATES NUCLEAR REGULATORY COMMISSION

CENTRAL VERMONT PUBLIC SERVICE CORPORATION

MILLSTONE POWER STATION, UNIT NO. 3

DOCKET NO. 50-423

NOTICE OF CONSIDERATION OF

APPROVAL OF APPLICATION REGARDING PROPOSED ACQUISITION

AND

OPPORTUNITY FOR A HEARING

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Notice of request for license transfer, opportunity to comment, opportunity to request a hearing.

**DATES:** Comments must be filed by **[INSERT DATE: 30 DAYS FROM DATE OF PUBLICATION OF THIS FEDERAL REGISTER NOTICE]**. A request for a hearing must be filed by **[INSERT DATE: 20 DAYS FROM DATE OF PUBLICATION OF THIS FEDERAL REGISTER NOTICE]**.

**ADDRESSES:** Please include Docket ID **NRC-20XX-XXXX** in the subject line of your comments. Comments submitted in writing or in electronic form will be posted on the NRC Web site and on the Federal rulemaking Web site http://www.regulations.gov. Because your comments will not be edited to remove any identifying or contact information, the NRC cautions you against including any information in your submission that you do not want to be publicly disclosed.

The NRC requests that any party soliciting or aggregating comments received from other persons for submission to the NRC inform those persons that the NRC will not edit their

comments to remove any identifying or contact information, and therefore, they should not include any information in their comments that they do not want publicly disclosed.

You may submit comments by any one of the following methods.

**Federal Rulemaking Web Site:** Go to http://www.regulations.gov and search for documents filed under Docket ID **NRC-20XX-XXXX.** Address questions about NRC dockets to Carol Gallagher 301-492-3668; e-mail Carol.Gallagher@nrc.gov.

**Mail comments to:** Chief, Rules, Announcements, and Directives Branch (RADB), Office of Administration, Mail Stop: TWB-05-B01M, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

**Fax comments to:** RADB at 301-492-3446.

You can access publicly available documents related to this notice using the following methods:

**NRC's Public Document Room (PDR):** The public may examine and have copied, for a fee, publicly available documents at the NRC's PDR, O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

**NRC's Agencywide Documents Access and Management System (ADAMS):** Publicly available documents created or received at the NRC are available online in the NRC Library at http://www.nrc.gov/reading-rm/adams.html. From this page, the public can gain entry into ADAMS, which provides text and image files of the NRC's public documents. If you do not have access to ADAMS or if there are problems in accessing the documents located in ADAMS, contact the NRC's PDR reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to pdr.resource@nrc.gov. The application dated September 9, 2011, as supplemented by letter dated November 4, 2011, is available electronically under ADAMS Accession Nos. ML11256A051 and ML11311A148, respectively.

**FOR FURTHER INFORMATION CONTACT:** Carleen J. Sanders, Project Manager, Plant Licensing Branch I-2, Division of Operating Reactor Licensing, Office of Nuclear Reactor

Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555. Telephone: 301-415-1603: fax number: 301-415-2102; e-mail: carleen.sanders@nrc.gov.

**Background**

The U.S. Nuclear Regulatory Commission (the Commission) is considering the issuance of an order under 10 CFR 50.80 approving the indirect transfer of the Renewed Facility Operating License (No. NPF-49) for the Millstone Power Station, Unit No. 3 (MPS3) to the extent held by Central Vermont Public Service Corporation (CVPS). CVPS is a 1.7303% minority co-owner of MPS3. The remaining co-owners are Massachusetts Municipal Wholesale Electric Company (4.7990%) and Dominion Nuclear Connecticut, Inc. (93.4707%). Dominion Nuclear Inc. is the licensed operator. According to an application for approval filed by CVPS in connection with the acquisition of CVPS by Gaz Métro Limited Partnership, CVPS will become an indirect wholly owned subsidiary of Gaz Métro Limited Partnership. CVPS will continue to be a minority co-owner and licensee of the facility. This application does not affect Massachusetts Municipal Wholesale Electric Company's ownership or Dominion Nuclear Connecticut, Inc.'s ownership and operation of the facility.

No physical changes to the MPS3 facility or operational changes are being proposed in the application.

Pursuant to 10 CFR 50.80, no license, or any right thereunder, shall be transferred, directly or indirectly, through transfer of control of the license, unless the Commission shall give its consent in writing. The Commission will approve an application for the indirect transfer of a license, if the Commission determines that the proposed acquisition will not affect the qualifications of the licensee to hold the license, and that the transfer is otherwise consistent

with applicable provisions of law, regulations, and orders issued by the Commission pursuant thereto.

The filing of requests for hearing and petitions for leave to intervene, and written comments with regard to the license transfer application, are discussed below.

**Hearing Request**

Within 20 days from the date of publication of this notice, any person(s) whose interest may be affected by the Commission's action on the application may request a hearing and intervention via electronic submission through the NRC E-filing system. Requests for a hearing and petitions for leave to intervene should be filed in accordance with the Commission's rules of practice set forth in Subpart C , "Rules of General Applicability: Hearing Requests, Petitions to Intervene, Availability of Documents, Selection of Specific Hearing Procedures, Presiding Officer Powers, and General Hearing Management for NRC Adjudicatory Hearings," of 10 CFR Part 2. In particular, such requests and petitions must comply with the requirements set forth in 10 CFR 2.309. Untimely requests and petitions may be denied, as provided in 10 CFR 2.309(c)(1), unless good cause for failure to file on time is established. In addition, an untimely request or petition should address the factors that the Commission will also consider, in reviewing untimely requests or petitions, set forth in 10 CFR 2.309(c)(1)(i)-(viii). NRC regulations are accessible electronically from the NRC Library on the NRC Web site at http://www.nrc.gov/reading-rm/doc-collections/cfr/.

All documents filed in NRC adjudicatory proceedings, including a request for hearing, a petition for leave to intervene, any motion or other document filed in the proceeding prior to the submission of a request for hearing or petition to intervene, and documents filed by interested governmental entities participating under 10 CFR 2.315(c), must be filed in accordance with the NRC E-Filing rule (72 FR 49139, August 28, 2007). The E-Filing process requires participants

to submit and serve all adjudicatory documents over the internet, or in some cases to mail copies on electronic storage media. Participants may not submit paper copies of their filings unless they seek an exemption in accordance with the procedures described below.

To comply with the procedural requirements of E-Filing, at least ten (10) days prior to the filing deadline, the participant should contact the Office of the Secretary by e-mail at hearing.docket@nrc.gov, or by telephone at (301) 415-1677, to request (1) a digital ID certificate, which allows the participant (or its counsel or representative) to digitally sign documents and access the E-Submittal server for any proceeding in which it is participating; and (2) advise the Secretary that the participant will be submitting a request or petition for hearing (even in instances in which the participant, or its counsel or representative, already holds an NRC-issued digital ID certificate). Based upon this information, the Secretary will establish an electronic docket for the hearing in this proceeding if the Secretary has not already established an electronic docket.

Information about applying for a digital ID certificate is available on NRC's public Web site at http://www.nrc.gov/site-help/e-submittals/apply-certificates.html. System requirements for accessing the E-Submittal server are detailed in NRC's "Guidance for Electronic Submission," which is available on the agency's public Web site at http://www.nrc.gov/site-help/e-submittals.html. Participants may attempt to use other software not listed on the Web site, but should note that the NRC's E-Filing system does not support unlisted software, and the NRC Meta System Help Desk will not be able to offer assistance in using unlisted software.

If a participant is electronically submitting a document to the NRC in accordance with the E-Filing rule, the participant must file the document using the NRC's online, Web-based submission form. In order to serve documents through EIE, users will be required to install a Web browser plug-in from the NRC Web site. Further information on the Web-based

submission form, including the installation of the Web browser plug-in, is available on the NRC's public Web site at http://www.nrc.gov/site-help/e-submittals.html.

Once a participant has obtained a digital ID certificate and a docket has been created, the participant can then submit a request for hearing or petition for leave to intervene. Submissions should be in Portable Document Format (PDF) in accordance with NRC guidance available on the NRC public Web site at http://www.nrc.gov/site-help/e-submittals.html. A filing is considered complete at the time the documents are submitted through the NRC's E-Filing system. To be timely, an electronic filing must be submitted to the E-Filing system no later than 11:59 p.m. Eastern Time on the due date. Upon receipt of a transmission, the E-Filing system time-stamps the document and sends the submitter an e-mail notice confirming receipt of the document. The E-Filing system also distributes an e-mail notice that provides access to the document to the NRC Office of the General Counsel and any others who have advised the Office of the Secretary that they wish to participate in the proceeding, so that the filer need not serve the documents on those participants separately. Therefore, applicants and other participants (or their counsel or representative) must apply for and receive a digital ID certificate before a hearing request/petition to intervene is filed so that they can obtain access to the document via the E-Filing system.

A person filing electronically using the agency's adjudicatory E-Filing system may seek assistance by contacting the NRC Meta System Help Desk through the "Contact Us" link located on the NRC Web site at http://www.nrc.gov/site-help/e-submittals.html, by e-mail at MSHD.Resource@nrc.gov, or by a toll-free call at (866) 672-7640. The NRC Meta System Help Desk is available between 8 a.m. and 8 p.m., Eastern Time, Monday through Friday, excluding government holidays.

Participants who believe that they have a good cause for not submitting documents electronically must file an exemption request, in accordance with 10 CFR 2.302(g), with their

initial paper filing requesting authorization to continue to submit documents in paper format. Such filings must be submitted by: (1) first class mail addressed to the Office of the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, Attention: Rulemaking and Adjudications Staff; or (2) courier, express mail, or expedited delivery service to the Office of the Secretary, Sixteenth Floor, One White Flint North, 11555 Rockville Pike, Rockville, Maryland, 20852, Attention: Rulemaking and Adjudications Staff. Participants filing a document in this manner are responsible for serving the document on all other participants. Filing is considered complete by first-class mail as of the time of deposit in the mail, or by courier, express mail, or expedited delivery service upon depositing the document with the provider of the service. A presiding officer, having granted an exemption request from using E-Filing, may require a participant or party to use E-Filing if the presiding officer subsequently determines that the reason for granting the exemption from use of E-Filing no longer exists.

Documents submitted in adjudicatory proceedings will appear in NRC's electronic hearing docket which is available to the public at http://ehd1.nrc.gov/EHD/, unless excluded pursuant to an order of the Commission, or the presiding officer. Participants are requested not to include personal privacy information, such as social security numbers, home addresses, or home phone numbers in their filings, unless an NRC regulation or other law requires submission of such information. With respect to copyrighted works, except for limited excerpts that serve the purpose of the adjudicatory filings and would constitute a Fair Use application, participants are requested not to include copyrighted materials in their submission.

Petitions for leave to intervene must be filed no later than 20 days from the date of publication of this notice. Non-timely filings will not be entertained absent a determination by the presiding officer that the petition or request should be granted or the contentions should be admitted, based on a balancing of the factors specified in 10 CFR 2.309(c)(1)(i)–(viii).

The Commission will issue a notice or order granting or denying a hearing request or intervention petition, designating the issues for any hearing that will be held and designating the Presiding Officer. A notice granting a hearing will be published in the *Federal Register* and served on the parties to the hearing.

**Comments**

Within 30 days from the date of publication of this notice, persons may submit written comments regarding the license transfer application, as provided for in 10 CFR 2.1305. The Commission will consider and, if appropriate, respond to these comments, but such comments will not otherwise constitute part of the decisional record. Comments should be submitted to the Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, Attention: Rulemakings and Adjudications Staff, and should cite the publication date and page number of this *Federal Register* notice.

For further details with respect to this license transfer application, see the application dated September 9, 2011, as supplemented by letter dated November 4, 2011, available for public inspection at the Commission's Public Document Room (PDR), located at One White Flint North, Public File Area O1 F21, 11555 Rockville Pike (first floor), Rockville, Maryland. Publicly available documents created or received at the NRC are accessible electronically through ADAMS in the NRC Library at http://www.nrc.gov/reading-rm/adams.html. Persons who do not have access to ADAMS or who encounter problems in accessing the documents located in ADAMS should contact the NRC PDR Reference staff by telephone at 1-800-397-4209, or 301-415-4737 or by e-mail to pdr.resource@nrc.gov.

Dated at Rockville, Maryland this 15th day of February 2012.

FOR THE NUCLEAR REGULATORY COMMISSION

Carleen J. Sanders, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

February 15, 2012

Mr. Dale A. Rocheleau
Senior Vice President, General Counsel
& Corporate Secretary
Central Vermont Public Service Corporation
77 Grove St.
Rutland VT, 05701

SUBJECT: NOTICE OF CONSIDERATION OF APPROVAL OF APPLICATION REGARDING PROPOSED ACQUISITION AND OPPORTUNITY FOR A HEARING – MILLSTONE POWER STATION, UNIT NO. 3 (TAC NO. 7127)

Dear Mr. Rocheleau:

Enclosed is a copy of a "Notice of Consideration of Approval of Application Regarding Proposed Acquisition and Opportunity for a Hearing," related to the application dated September 9, 2011, as supplemented by letter dated November 4, 2011,[1] filed by Central Vermont Public Service Corporation (CVPS). The application, pursuant to 10 CFR 50.80, seeks U.S. Nuclear Regulatory Commission (NRC) approval of the proposed indirect transfer of the license to the extent effected by the proposed acquisition of CVPS by Gaz Métro Limited Partnership.

This notice is being forwarded to the Office of the Federal Register for publication.

Sincerely,
***/ra/***

Carleen J. Sanders, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-423

Enclosure:
Notice

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**ADAMS Accession Nos.** PKG **ML120100492** LTR **ML120100498** **Indiv License Transfer (ADM-012) FRN ML120100508**

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|---|---|---|---|---|---|---|---|
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| DATE | 01/15/12 | 01/17/12 | 01/20/12 | 01/23/12 | 02/10/12 | 02/14/12 | 02/15 /12 |

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[1] Agencywide Documents Access and Management System Accession Nos. ML11256A051 and ML11311A148, respectively.

**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
**REGION I**
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

February 17, 2012

Mr. David Heacock
President and Chief Nuclear Officer
Dominion Resources
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION - NRC MATERIAL CONTROL AND ACCOUNTING PROGRAM INSPECTION REPORT NO. 05000336/2011406 AND 05000423/2011406

Dear Mr. Heacock:

On January 24, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed a security baseline inspection at your Millstone Power Station Unit 2 and Unit 3. The inspection report documents one of the key attributes of the security cornerstone of the NRC's Reactor Oversight Process. The enclosed inspection report documents the inspection results, which were discussed on January 24, 2012, with Mr. S. E. Scace and other members of your staff.

The inspection examined activities conducted under your license as they relate to security and compliance with the Commission's rules and regulations and with the conditions of your license. The inspector reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, no findings were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room). However, the material enclosed herewith contains Security-Related Information in accordance with 10 CFR 2.390(3)(1) and its disclosure to unauthorized individuals could present a security vulnerability. Therefore, the material in the enclosure will not be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Website at http://www.nrc.gov/reading-rm/adams.html. If Security-Related Information is necessary to provide an acceptable response, please mark your entire

Enclosure contains Sensitive Unclassified Non-Safeguards Information. When separated from the Enclosure, this document is decontrolled.

response Security-Related Information in accordance with 10 CFR 2.390(d)(1) and follow the instructions for withholding in 10 CFR 2.390(b)(1). In accordance with 10 CFR 2.390(b)(1)(ii), the NRC is waiving the affidavit requirements for your response.

Sincerely,

/***RA***/

Raymond J. Powell, Chief
Technical Support and Assessment Branch
Division of Reactor Projects

Docket Nos. 50-336, 50-423
License Nos. DPR-65, NPF-49

Nonpublic Enclosure: Inspection Report 05000336/2011406 and 05000423/2011406
w/Attachment: Supplemental Information

cc w/encl; w/OUO-SRI
P. Baumann, Security Department Manager
F. Murray, President and CEO, NYSERDA, State of New York
J. Sherry, New York State Office of Homeland Security
E. Wilds, Jr., PH.D., State Liaison Officer, State of Connecticut

cc w/o encl; w/o OUO-SRI: Distribution via ListServ

response Security-Related Information in accordance with 10 CFR 2.390(d)(1) and follow the instructions for withholding in 10 CFR 2.390(b)(1). In accordance with 10 CFR 2.390(b)(1)(ii), the NRC is waiving the affidavit requirements for your response.

Sincerely,

/***RA***/

Raymond J. Powell, Chief
Technical Support and Assessment Branch
Division of Reactor Projects

Docket Nos. 50-336, 50-423
License Nos. DPR-65, NPF-49

Nonpublic Enclosure: Inspection Report 05000336/2011406 and 05000423/2011406
w/Attachment: Supplemental Information

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**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
**WASHINGTON, D.C. 20555-0001**

February 17, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Nuclear
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: KEWAUNEE POWER STATION, MILLSTONE POWER STATION UNITS 1, 2, AND 3, NORTH ANNA POWER STATION UNITS 1 AND 2, SURRY POWER STATION UNITS 1 AND 2 AND THEIR RESPECTIVE INDEPENDENT SPENT FUEL STORAGE INSTALLATIONS – REVIEW OF DOMINION FLEET QUALITY ASSURANCE TOPICAL REPORT, REVISION 11 (TAC NOS. ME6648, ME6649, ME6650, ME6651, ME6652, ME6653, AND ME6654)

Dear Mr. Heacock:

By letter dated June 28, 2011, as supplemented by letter dated August 15, 2011, Dominion Resources Services, Inc., on behalf of Dominion Energy Kewaunee, Inc., Dominion Nuclear Connecticut, Inc., and Virginia Electric and Power Company (collectively, the licensees), submitted Revision 11 of the fleet Quality Assurance Topical Report, DOM-QA-1, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Sections 50.54(a)(3) and 50.71(e), for Kewaunee Power Station, Millstone Power Station, Units 1, 2, and 3, North Anna Power Station, Units 1 and 2, Surry Power Station, Units 1 and 2, and their respective independent spent fuel storage installations.

The U.S. Nuclear Regulatory Commission (NRC) reviewed the submittals and has concluded that the licensees' quality assurance program description, including alternatives, adequately addresses the requirements of Appendix B to 10 CFR Part 50 and is therefore, acceptable.

The NRC staff's safety evaluation is enclosed. If you have any questions, please contact me at (301) 415-3079.

Sincerely,

Karl D Feintuch

Karl Feintuch, Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-305; 50-245, 50-336, 50-423;
50-338, 50-339; 50-280, 50-281;
72-64; 72-47; 72-16, 72-56; 72-2, 72-55

Enclosure:
Safety Evaluation

cc w/encl: Distribution via ListServ

**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
**WASHINGTON, D.C. 20555-0001**

# SAFETY EVALUATION BY THE

# OFFICE OF NUCLEAR REACTOR REGULATION

# RELATED TO

# RENEWED FACILITY OPERATING LICENSE NO. DPR-43

# FOR THE KEWAUNEE POWER STATION, DOCKET NO. 50-305

# RENEWED FACILITY OPERATING LICENSE NO. NPF-4

# FOR THE NORTH ANNA POWER STATION, UNIT 1, DOCKET NO. 50-338

# RENEWED FACILITY OPERATING LICENSE NO. NPF-7

# FOR THE NORTH ANNA POWER STATION, UNIT 2, DOCKET NO. 50-339

# RENEWED FACILITY OPERATING LICENSE NO. DPR-32

# FOR THE SURRY POWER STATION, UNIT 1, DOCKET NO. 50-280

# RENEWED FACILITY OPERATING LICENSE NO. DPR-37

# FOR THE SURRY POWER STATION, UNIT 2, DOCKET NO. 50-281

# FACILITY OPERATING LICENSE NO. DPR-21

# FOR THE MILLSTONE POWER STATION, UNIT 1, DOCKET NO. 50-245

# RENEWED FACILITY OPERATING LICENSE NO. DPR-65

# FOR THE MILLSTONE POWER STATION, UNIT 2, DOCKET NO. 50-336

# RENEWED FACILITY OPERATING LICENSE NO. NPF-49

# FOR THE MILLSTONE POWER STATION, UNIT 3, DOCKET NO. 50-423

# AND THEIR RESPECTIVE

# INDEPENDENT SPENT FUEL STORAGE INSTALLATIONS

Enclosure

## 1.0 INTRODUCTION

By letter dated June 28, 2011 (Reference 1) Dominion Resources Services, Inc., on behalf of Dominion Energy Kewaunee, Inc., Dominion Nuclear Connecticut, Inc., and Virginia Electric and Power Company (collectively, Dominion, the licensees) submitted their periodic update of the Nuclear Facilities Quality Assurance Program Description (NFQAPD) Topical Report (DOM-QA-1), Revision 11, pertaining to Kewaunee Power Station; Millstone Power Station, Units 1, 2, and 3; North Anna Power Station, Units 1 and 2; and Surry Power Station, Units 1 and 2, and their respective independent spent fuel storage installations (ISFSIs). The submittal was subsequently revised by the licensees' letter dated August 15, 2011, (Reference 2) to reflect the licensees' response to a Nuclear Regulatory Commission (NRC) request for additional information (RAI) (Reference 3).

## 2.0 BACKGROUND

The periodic updates made to the NFQAPD Topical Report were submitted by the June 28, 2011, letter (as Attachment 1) in accordance with the provisions of Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.71(e). During the NRC staff's review of the latest updates to DOM-QA-1 the staff noted that the June 28, 2011 letter stated that: "Attachment 2 provides a discussion of changes made to DOM-QA-1 for reduction in commitment." In RAI-1, the staff requested the licensees to explain and resolve the discrepancy between the cover letter of the Topical Report (Reference 1) that characterized the changes to DOM-QA-1 as a reduction in commitment, relative to the analysis in Attachment 2, which concluded that the same changes were not reductions in commitment. In its response (Reference 2) the licensees included a clarifying statement explaining that Attachment 2 contained no changes that resulted in a reduction in commitment to DOM-QA-1.

Topical Report letter dated August 15, 2011, provided additional information in support of the revision to the DOM-QA-1, submitted as Attachment 3 of the original submittal. The QA program described in the NFQAPD commits to the guidance of the American Society of Mechanical Engineers (ASME) Nuclear Quality Assurance (NQA) standard NQA-1/1994, "Quality Assurance Requirements for Nuclear Applications."

## 3.0 REGULATORY EVALUATION

The Commission's regulatory requirements related to QA programs are set forth in Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, 10 CFR 50.34(b)(6)(ii), and 10 CFR 50.54(a).

Appendix B of 10 CFR 50 establishes QA requirements for the design, construction, and operation of structures, systems, and components (SSCs) of the facility. The pertinent requirements of Appendix B to 10 CFR Part 50 apply to all activities affecting the safety-related functions of those SSCs, and include designing, purchasing, fabricating, handling, shipping, storing, cleaning, erecting, installing, inspecting, testing, operating, maintaining, repairing, refueling, and modifying.

Section 50.34 of 10 CFR 50, "Contents of [construction permit and operating license] applications; technical information," requires that every applicant for an operating license include

information in its Final Safety Analysis Report (FSAR) on the managerial and administrative controls to be used to assure safe operation. The information on the controls shall also include a discussion of how the applicable requirements of Appendix B will be satisfied.

Section 50.54(a)(3) of 10 CFR 50, states that licensees may make a change to a previously accepted QA program description included or referenced in the SAR without prior NRC approval, provided the change does not reduce the commitments in the program description as accepted by the NRC. Changes to the QAPD that do reduce the commitments must be submitted to the NRC and receive NRC approval prior to implementation.

## 4.0 EVALUATION

The NRC staff evaluated the adequacy of the QA Topical Report (QATR) in its description of how the requirements of Appendix B to 10 CFR Part 50 would be satisfied. The format and content of the QATR were evaluated in accordance with the guidance of NUREG-0800, "Standard Review Plan," Section 17.5 (SRP 17.5), which provides a basis for the NRC staff review of QA programs based on Standard NQA-1-1994. The acceptability of the level of detail provided by the QATR is determined, in part, by its adequacy in addressing the acceptance criteria of SRP 17.5.

### 4.1 Acceptability of the QA Program Description

#### 4.1.1 Control of Purchased Material, Equipment, and Services

The licensees have established the necessary measures and governing procedures to control the procurement of items and services to assure conformance with specified requirements. Such controls shall provide for the following, as appropriate: source evaluation and selection, evaluation of objective evidence of quality furnished by the supplier, source inspection, audit, and examination of items or services upon delivery of completion. The licensees, as part of the periodic update made to DOM-QA-1, added an alternative to the NQA-1-1994, Supplement 7S-1, to provide acceptance of commercial grade calibration services by a nationally recognized accreditation body in lieu of a commercial grade survey. Pursuant to 10 CFR 50.54(a)(3)(ii), licensees may adopt use of a quality assurance alternative or exception approved by an NRC safety evaluation, provided that the bases of the NRC approval are applicable to the licensee's facility. The NRC staff found that the proposed changes were similar to the alternatives cited as precedence by the licensees (Reference 4). In RAI-2, the NRC staff requested the licensees to clarify how DOM-QA-1 intends to implement the proposed alternative (NQA-1-1994, Supplement 7S-1) to be consistent with Section 17.5, paragraph II.L.8 of the SRP. In its response, the licensees revised DOM-QA-1 to be consistent with paragraph II.L.8 of SRP 17.5.

Dominion supplemented the initial proposed alternative by adding two new conditions in order to satisfy the guidance in SRP 17.5: (1) the calibration laboratory is a domestic (United States) calibration service supplier, and (2) the proposed alternative also applies to sub-suppliers of calibration services. In establishing a program for the control of items and services, the licensees commit to compliance with Appendix B to 10 CFR Part 50, Criterion VII and NQA-1, Basic Requirement 7 and Supplement 7S-1 with clarifications and exceptions to 7S-1.

As set forth above, the staff reviewed the QA measures to be implemented by the licensees and concluded that the program for the control of purchased material, equipment, and services meets the guidance in SRP 17.5.

## 5.0 CONCLUSION

The NRC staff evaluated the licensees' QATR (Reference 2) submittal and the supplemental correspondence. The NRC staff concludes that the licensees' QA program description, including alternatives, adequately addresses the requirements of Appendix B to 10 CFR Part 50 and is therefore, acceptable.

## 6.0 REFERENCES

1. L. N. Hartz, Dominion Energy Kewaunee, Inc., Dominion Nuclear Connecticut, Inc. and Virginia Electric and Power Company, to the NRC, "Virginia Electric and Power Company, Kewaunee Power Station and ISFSI [independent spent fuel storage installation], Millstone Power Station Units 1, 2, and 3 and ISFSI, North Anna Power Station Units 1 and 2 and ISFSI, Surry Power Station Units 1 and 2 and ISFSI, Submission of Revision 11 of the Quality Assurance Topical Report," dated June 28, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML111800730).

2. J. Alan Price, Dominion Energy Kewaunee, Inc., Dominion Nuclear Connecticut, Inc. and Virginia Electric and Power Company, to the NRC, "Dominion Energy Kewaunee, Inc. Dominion Nuclear Connecticut, Inc. Virginia Electric and Power Company, Kewaunee Power Station and ISFSI [independent spent fuel storage installation], Millstone Power Station Units 1, 2, & 3 and ISFSI, North Anna Power Station Units 1 & 2 and ISFSI, Surry Power Station Units 1 & 2 and ISFSI, Re-Submission of Quality Assurance Topical Report," dated August 15, 2011 (ADAMS Accession No. ML11245A077).

3. Karl Feintuch, NRC electronic correspondence (email) to Craig D. Sly, Dominion Resources Services, Inc., Nuclear Licensing and Operations Support, "ME6648-54 Dominion QATR review Draft RAI Questions Re: Proposed changes to DOM-QA-1 Topical Report," dated July 11, 2011 (ADAMS Accession No. ML11192A186).

4. Safety Evaluation by the NRC Office of Nuclear Reactor Regulation regarding Proposed Change to the Quality Assurance Program, "Palo Verde Nuclear Generating Station, Units 1, 2, and 3 - Approval of Change to Quality Assurance Program (Commercial-Grade Calibration Services)," dated September 28, 2005 (ADAMS Accession Number ML052710224).

Principal Contributor: J. Ortega-Luciano, NRR

Date: February 17, 2012

The NRC staff's safety evaluation is enclosed. If you have any questions, please contact me at (301) 415-3079.

Sincerely,

**/RA/**

Karl Feintuch, Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-305; 50-245, 50-336, 50-423;
50-338, 50-339; 50-280, 50-281;
72-64; 72-47; 72-16, 72-56; 72-2, 72-55

Enclosure:
Safety Evaluation

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 24, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
Virginia Electric and Power Company
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION, UNIT NOS. 1, 2 AND 3, EXEMPTION FROM CERTAIN REQUIREMENTS OF TITLE 10 OF THE *CODE OF FEDERAL REGULATIONS*, PART 26 WORK HOUR CONTROLS DURING PERIODS OF SEVERE WEATHER CONDITIONS (TAC NOS. ME5674, ME5675, AND ME5676)

Dear Mr. Heacock:

The Nuclear Regulatory Commission has approved the enclosed exemption from certain requirements of Title 10 of the *Code of Federal Regulations* (10 CFR), Part 26, for Millstone Power Station, Unit Nos. 1, 2 and 3 (Millstone). This action is in response to your application dated February 10, 2011, as supplemented on March 10, and August 31, 2011, and February 6, 2012.

Pursuant to 10 CFR 26.9, Dominion Nuclear Connecticut, Inc. (Dominion) requested an exemption from the requirements of 10 CFR 26.205(c) and (d) for meeting work hour controls during declarations of severe weather conditions involving tropical storm or hurricane force winds. The exemption request applies to individuals on the station hurricane response organization who perform duties identified in 10 CFR 26.4(a)(1) through (a)(5) who are sequestered onsite during severe weather when travel conditions to the site are potentially hazardous.

A copy of the exemption is enclosed. The exemption has been forwarded to the Office of the Federal Register for publication.

Sincerely,

Carleen J. Sanders, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-245, 50-336, and 50-423

Enclosure:
Exemption

NUCLEAR REGULATORY COMMISSION

NRC-2012-XXXX

DOMINION NUCLEAR CONNECTICUT, INC.

MILLSTONE POWER STATION, UNIT NOS. 1, 2 AND 3

DOCKET NOS. 50-245, 50-336 AND 50-423

EXEMPTION

## 1.0 BACKGROUND

Dominion Nuclear Connecticut, Inc. (DNC or the licensee) is the holder of Facility Operating License Nos. DRP-21, DPR-65 and NPF-49, which authorize operation of the Millstone Power Station, Unit Nos. 1, 2 and 3 (Millstone), respectively. The license provides, among other things, that the facility is subject to all rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (NRC, the Commission) now or hereafter in effect.

The facility consists of one boiling water reactor and two pressurized-water reactors located in New London County, Connecticut. The boiling water reactor is permanently shut down.

## 2.0 REQUEST/ACTION

Title 10 of the *Code of Federal Regulations* (10 CFR) Part 26, "Fitness For Duty Programs," Subpart I, "Managing Fatigue," requires that individuals described in 10 CFR 26.4(a)(1) through (a)(5) are subject to the work hour controls provided in 10 CFR 26.205. By letter dated February 10, 2011,[1] supplemented by letters dated March 10, 2011, and February 6, 2012,[2] and pursuant to 10 CFR 26.9, DNC, doing business as Dominion, requested an exemption from the requirements of 10 CFR 26.205(c) and (d) during declarations of severe

[1] Agencywide Documents Access and Management System (ADAMS) Accession No. ML110450583
[2] ADAMS Accession Nos. ML110740442 and ML12047A143, respectively

weather conditions such as tropical storm and hurricane force winds at the Millstone site. A subsequent response to requests for additional information (RAI) is dated August 31, 2011.[3]

The requested exemption applies to individuals who perform duties identified in 10 CFR 26.4(a)(1) through (a)(5) who are designated to perform work as a member of the Millstone hurricane response organization (HRO). The exemption request states that the station HRO typically consists of enough individuals to staff two 12-hour shifts of workers consisting of personnel from operations, maintenance, engineering, emergency planning, radiation protection, chemistry, site services and security to maintain the safe and secure operation of the plant.

Entry conditions for the requested exemption occur when the site activates the Station Hurricane Command Center and the Site Vice President (or his designee) determines that travel conditions to the site will potentially become hazardous such that HRO staffing will be required - based on verifiable weather conditions. Verifiable weather conditions are defined in the exemption request as when the National Weather Service issues an Inland High Wind Warning for Hurricane Force Winds for New London County or when the Dominion Weather Center projects tropical storm or hurricane force winds onsite within 12 hours.

After the high wind conditions pass, wind damage to the plant and surrounding area might preclude a sufficient number of individuals from immediately returning to the site. Additionally, if mandatory civil evacuations were ordered, this would delay the return of sufficient relief personnel. The exemption request states that the exemption will terminate when hurricane watches and warnings or inland hurricane watches and warnings have been cancelled; when weather conditions and highway infrastructure support safe travel; and when the Site Vice President or his designee determine that sufficient personnel who perform the duties identified in 10 CFR 26.4(a)(1) through (a)(5) are available to restore normal shift rotation and thereby meet the requirements of 10 CFR 26.205(c) and (d).

---

[3] ADAMS Accession No. ML11250A168

3.0 DISCUSSION

Pursuant to 10 CFR 26.9, the Commission may, upon application of an interested person or on its own initiative, grant exemptions from the requirements of 10 CFR Part 26 when the exemptions are authorized by law and will not endanger life or property or the common defense and security, and are otherwise in the public interest.

Authorized by Law

The exemption being requested for Millstone would, as noted above, allow the Millstone site to not meet the work hour control requirements of 10 CFR 26.205(c) and (d), which would allow the site to sequester specific individuals on site, prior and subsequent to severe weather conditions such as tropical storms and hurricanes. No law exists which precludes the activities covered by this exemption request. As stated above, 10 CFR 26.9 allows the NRC to grant exemptions from the requirements of 10 CFR Part 26. The NRC staff has determined that granting of the licensee's proposed exemption will not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations. Therefore, NRC approval of the licensee's exemption request is authorized by law.

No Endangerment of Life or Property and Otherwise in the Public Interest

This exemption request expands on an exception that is already provided in 10 CFR Part 26, during declared emergencies, and allows the licensee to not meet the requirements in 10 CFR 26.205(c) and (d) during time periods just prior and subsequent to the existing exception (10 CFR 26.207(d)). Granting this exemption will allow the licensee to ensure that the control of work hours does not impede the ability to use whatever staff resources may be necessary to respond to a severe weather event to ensure the plant reaches and maintains a safe and secure status. Therefore, this exemption will not endanger life or property or the common defense and security. Thus, this exemption request is in the interest of the public health and safety.

The Fatigue Management provisions found in 10 CFR Part 26 Subpart I are designed as an integrated approach to managing both cumulative and acute fatigue through a partnership between licensees and individuals. It is the responsibility of the licensee to provide training to individuals regarding fatigue management. It is also the responsibility of the licensee to provide covered workers with work schedules that are consistent with the objective of preventing impairment from fatigue due to duration, frequency or sequencing of successive shifts. Individuals are required to remain fit-for-duty while at work.

- Section 26.205(c) is the requirement to schedule individuals work hours consistent with the objective of preventing impairment from fatigue due to duration, frequency or sequencing of successive shifts. The requirement to schedule is important as the work hour controls, contained in 10 CFR 26.205, are not necessarily sufficient to ensure that individuals will not be impaired owing to the effects of fatigue.
- Section 26.205(d) provides the actual work hour controls. Work hour controls are limits on the number of hours an individual may work; limits on the minimum break times between work periods; and limits for the minimum number of days off an individual must be given.
- Section 26.205(b) is the requirement to count work hours and days worked. 10 CFR 26.205(d)(3) is the requirement to look back into the "calculation period" so that all work hours can be included in appropriate work hour calculations, when a covered individual resumes covered work.
- Section 26.207(d) provides an allowance for licensees to not meet the requirements of Section. 26.205(c) and (d) during declared emergencies as defined in the licensee's emergency plan.

Millstone is located in the Town of Waterford, New London County, Connecticut, on the north shore of Long Island Sound. The 50-mile segment of coastline on which Millstone is located

was crossed by 5 hurricanes during a period of approximately 84 years. Due to the location of the plant and its proximity to the aforementioned coastline, there is a sufficient likelihood of hurricane watches and warnings or inland hurricane wind watches and warnings impacting the site. The proposed exemption would support effective response to severe weather conditions when travel to and from Millstone may not be safe.

During these times, the Millstone HRO staff typically consists of enough individuals to staff two 12-hour shifts of workers consisting of personnel from operations, maintenance, engineering, emergency planning, radiation protection, chemistry, site services and security to maintain the safe and secure operation of the plant. This exemption would be applied to the period established by the entry and exit conditions regardless of whether the Emergency Plan is entered or not. Therefore, Millstone's exemption request can be characterized as having three parts: (1) high-wind exemption encompassing the period starting with the initiating conditions to just prior to declaration of an unusual event, (2) a period defined as immediately following a high-wind condition, when an unusual event is not declared, but when a recovery period is still required, and (3) a recovery exemption immediately following an existing 10 CFR 26.207(d) exception as discussed above. Once Millstone has entered into a high-wind exemption or 10 CFR 26.207(d) exception, it would not need to make a declaration that it is invoking the recovery exemption.

As a tropical storm or hurricane approaches landfall, high wind speeds - in excess of wind speeds that create unsafe travel conditions - are expected. The National Hurricane Center defines a hurricane warning as an announcement that hurricane conditions (sustained winds of 74 mph or higher) are expected somewhere within the specified coastal area within a 24-hour period. Severe wind preparedness activities become difficult once winds reach tropical storm force. A tropical storm warning is issued 36 hours in advance of the anticipated onset of tropical-storm-force winds (39 to 73 mph). Lessons learned that are included in NUREG-1474, "Effect of Hurricane Andrew on the Turkey Point Nuclear Generating Station from

August 20-30, 1992," include the acknowledgement that detailed, methodical preparations should be made prior to the onset of hurricane force winds. The NRC staff finds the Millstone proceduralized actions are consistent with those lessons learned.

The licensee's RAI response letter of August 31, 2011, states that the HRO shift start times will be pre-planned before the arrival of severe weather onsite and will emphasize the need for consistent work shift start times to better facilitate fatigue management. The RAI response also states that the hurricane response plan (nuclear) (HRP-N) will be updated to include that the HRO staff will be provided with an opportunity for restorative rest of at least 10 hours when off and that these individuals will not be assigned any duties when off shift. The updated HRP-N was provided by letter dated February 6, 2012, and included the opportunity for restorative rest for the HRO staff.

The exemption request specifies that the exemption is not for discretionary maintenance activities. The exemption request states that the exemption would provide for use of whatever plant staff and resources may be necessary to respond to a plant emergency and ensure that the units achieve and maintain a safe and secure status and can be safely restarted. The exemption request also states that maintenance activities for structures, systems and components that are significant to public health and safety will be performed, if required. The NRC staff finds the exclusion of discretionary maintenance from the exemption request to be consistent with the intent of the exemption.

In its exemption request, the licensee committed to maintain the following guidance in a Millstone site procedure:

- The conditions necessary to sequester site personnel that are consistent with the conditions specified in this exemption request.
- The provisions for ensuring that personnel who are not performing duties are provided an opportunity, as well as accommodations, for restorative rest.

- The condition for departure from this exemption, consistent with the Site Vice President's (or his designee's) determination that adequate staffing is available to meet the requirements of Part 26.205(c) and (d).

When the exemption period(s) ends, the licensee is immediately subject to the scheduling requirements of 10 CFR 26.205(c) and the work hour/rest break/days off requirements of 10 CFR 26.205(d), and must ensure that any individual performing covered work complies with these requirements. 10 CFR 26.205(d)(3) requires the licensee to "look back" over the calculation period and count the hours the individual has worked and the rest breaks and days off he/she has had, including those that occurred during the licensee-declared emergency. Hours worked must be below the maximum limits and rest breaks must be above the minimum requirements in order for the licensee to allow the individual to perform covered work. Days off and hours and shifts worked during the licensee-declared emergency and the exempted period before and after the declared emergency, would be counted as usual in the establishment of the applicable shift schedule and compliance with the minimum-days-off requirements.

Granting these exemptions is consistent with 10 CFR 26.207(d) Plant Emergencies which allows the licensee to not meet the requirements of 10 CFR 26.205 (c) and (d) during declared emergencies as defined in the licensee's emergency plan. The Part 26 Statement of Considerations, page 17148 states that, "[p]lant emergencies are extraordinary circumstances that may be most effectively addressed through staff augmentation that can only be practically achieved through the use of work hours in excess of the limits of § 26.205(c) and (d)." The objective of the exemption is to ensure that the control of work hours do not impede a licensee's ability to use whatever staff resources may be necessary to respond to a plant emergency and ensure that the plant reaches and maintains a safe and secure status. The actions described in the exemption request and submitted procedures are consistent with the recommendations in NUREG-1474. Also consistent with NUREG-1474, NRC staff expects the licensee would have

completed a reasonable amount of hurricane preparation prior to the need to sequester personnel, in order to minimize personnel exposure to high winds.

The NRC staff has reviewed the exemption request from certain work hour controls during conditions of high winds and recovery from high wind conditions. Based on the considerations discussed above, the NRC staff has concluded that (1) there is a reasonable assurance that the health and safety of the public will not be endangered by the proposed exemption, (2) such activities will be consistent with the Commission's regulations and guidance, and (3) the issuance of the exemption will not be contrary to the common defense and security or to the health and safety of the public.

Consistent with Common Defense and Security

This change has no relation to security issues. Therefore, the common defense and security is not impacted by this exemption.

## 4.0 CONCLUSION

Accordingly, the Commission has determined that, pursuant to 10 CFR 26.9, granting an exemption to the licensee from the requirements in 10 CFR 26.205(c) and (d) during severe wind events such as tropical storms and hurricanes and bounded by the entry and exit conditions of the exemption request, by allowing Millstone to sequester individuals to ensure the plant reaches and maintains a safe and secure status, is authorized by law and will not endanger life or property and is otherwise in the public interest. Therefore, the Commission hereby grants DNC an exemption from the requirements of 10 CFR 26.205(c) and (d) during periods of severe winds at the Millstone site.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will not have a significant effect on the quality of the human environment as published in the *Federal Register* on August 31, 2011 (76 FR 54260).

This exemption is effective upon issuance.

Dated at Rockville, Maryland, this 29th day of February 2012.

FOR THE NUCLEAR REGULATORY COMMISSION

Michele G. Evans, Director
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

February 24, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
Virginia Electric and Power Company
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION, UNIT NOS. 1, 2 AND 3, EXEMPTION FROM CERTAIN REQUIREMENTS OF TITLE 10 OF THE *CODE OF FEDERAL REGULATIONS*, PART 26 WORK HOUR CONTROLS DURING PERIODS OF SEVERE WEATHER CONDITIONS (TAC NOS. ME5674, ME5675, AND ME5676)

Dear Mr. Heacock:

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A copy of the exemption is enclosed. The exemption has been forwarded to the Office of the Federal Register for publication.

Sincerely,
***/ra/***
Carleen J. Sanders, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-245, 50-336, and 50-423

Enclosure:
Exemption

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February 24, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Resources
5000 Dominion Blvd.
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION – NRC BASELINE SECURITY INSPECTION REPORT 05000336/2012403 AND 05000423/2012403

Dear Mr. Heacock:

On February 9, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed a security inspection at your Millstone Power Station, Units 2 and 3. The inspection covered one or more of the key attributes of the security cornerstone of the NRC's Reactor Oversight Process. The enclosed inspection report documents the inspection results which were discussed on February 9, 2012, with Mr. Stephen Scace, Site Vice President and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

No findings were identified during this inspection.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's Agencywide Document Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Enclosure contains Sensitive Unclassified Non-Safeguards Information. When separated from enclosure, the transmittal document is decontrolled.

However, the material enclosed herewith contains Security-Related Information in accordance with 10 CFR 2.390(d)(1) and its disclosure to unauthorized individuals could present a security vulnerability. Therefore, the material in the enclosure will not be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Document Access and Management System (ADAMS). If you choose to provide a response and Security-Related Information is necessary to provide an acceptable response, please mark your entire response "Security-Related Information – Withhold from public disclosure under 10 CFR 2.390" in accordance with 10 CFR 2.390(d)(1) and follow the instructions for withholding in 10 CFR 2.390(b)(1). In accordance with 10 CFR 2.390(b)(1)(ii), the NRC is waiving the affidavit requirements for your response.

Sincerely,

***/RA/***

James M. Trapp, Chief
Plant Support Branch 1
Division of Reactor Safety

Docket Nos. 50-336, 50-423
License Nos. DPR-65, NPF-49

Enclosure:
Inspection Report 05000336/2012403 and 05000423/2012403
w/Attachment: Supplemental Information (OUO-SRI)

cc w/encl:
P. Baumann, Security Manager, Millstone Station
E. Wilds, Jr., Ph.D., Director, State of Connecticut SLO
J. Sherry, Director, Office of Counter Terrorism, NY State Department of Homeland Security
F. Murray, President & CEO, NY State Energy Research and Development Authority

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However, the material enclosed herewith contains Security-Related Information in accordance with 10 CFR 2.390(d)(1) and its disclosure to unauthorized individuals could present a security vulnerability. Therefore, the material in the enclosure will not be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Document Access and Management System (ADAMS). If you choose to provide a response and Security-Related Information is necessary to provide an acceptable response, please mark your entire response "Security-Related Information – Withhold from public disclosure under 10 CFR 2.390" in accordance with 10 CFR 2.390(d)(1) and follow the instructions for withholding in 10 CFR 2.390(b)(1). In accordance with 10 CFR 2.390(b)(1)(ii), the NRC is waiving the affidavit requirements for your response.

Sincerely,

***/RA/***

James M. Trapp, Chief
Plant Support Branch 1
Division of Reactor Safety

Docket Nos. 50-336, 50-423
License Nos. DPR-65, NPF-49

Enclosure:
Inspection Report 05000336/2012403 and 05000423/2012403
w/Attachment: Supplemental Information (OUO-SRI)

cc w/encl:
P. Baumann, Security Manager, Millstone Station
E. Wilds, Jr., Ph.D., Director, State of Connecticut SLO
J. Sherry, Director, Office of Counter Terrorism, NY State Department of Homeland Security
F. Murray, President & CEO, NY State Energy Research and Development Authority

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**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
**REGION I**
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

March 5, 2012

Mr. David Heacock
Sr. Vice President and Chief Nuclear Officer
Dominion Resources
500 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: ANNUAL ASSESSMENT LETTER FOR MILLSTONE POWER STATION UNIT 2 AND UNIT 3 (REPORT 05000336/2011001 AND 05000423/2011001)

Dear Mr. Heacock:

On February 14, 2012, the U. S. Nuclear Regulatory Commission (NRC) staff completed its end-of-cycle performance review of the Millstone Power Station Units 2 and 3. The NRC reviewed the most recent quarterly performance indicators (PIs) in addition to inspection results and enforcement actions from January 1, 2011 through December 31, 2011. This letter informs you of the NRC's assessment of your facility during this period and its plans for future inspections at your facility. This performance review and enclosed inspection plan do not include security information. A separate letter will include the NRC's assessment of your performance in the Security Cornerstone and its security-related inspection plan.

The NRC determined the performance at Millstone Power Station Unit 2 during the most recent quarter was within the Regulatory Response Column of the NRC's Reactor Oversight Process (ROP) Action Matrix based on one finding originating in the second quarter of 2011 having low to moderate safety significance (White) in the Initiating Events Cornerstone. This finding involves the failure of Unit 2 Millstone personnel to carry out their assigned roles and responsibilities and inadequate reactivity management during main turbine control valve testing, which contributed to an unintended eight percent reactor power transient (88 percent to 96 percent) on February 12, 2011.

As a result of our review of Millstone Power Station Unit 2 performance, we plan to conduct a supplemental inspection using NRC Inspection Procedure 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area," when your staff has notified us of your readiness for this inspection. This inspection procedure is conducted to provide assurance that the root cause and contributing causes of risk significant performance issues are understood, the extent of condition is identified, and the corrective actions are sufficient to prevent recurrence.

The NRC determined the performance at Millstone Unit 3 during the most recent quarter was within the Licensee Response Column of the NRC's ROP Action Matrix because all inspection findings had very low (i.e., green) safety significance, and all PIs indicated that your performance was within the nominal, expected range (i.e., green). Therefore, the NRC plans to conduct ROP baseline inspections at Millstone Unit 3.

The enclosed inspection plan details the inspections, less those related to physical protection, scheduled through June 30, 2013. Routine inspections performed by resident inspectors are not included in the inspection plan. In addition to the baseline inspections, the NRC will perform Temporary Instruction (TI) 2515/182, "Review of the Implementation of the Industry Initiative to Control Degradation of Underground Piping," in July 2012. The inspections listed during the last nine months of the inspection plan are tentative and may be revised at the mid-cycle performance review. The NRC provides the inspection plan to allow for the resolution of any scheduling conflicts and personnel availability issues. The NRC will contact you as soon as possible to discuss changes to the inspection plan should circumstances warrant any changes.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Please contact Dr. Ronald R. Bellamy at (610) 337-5200 with any questions you have regarding this letter.

Sincerely,

/***RA***/

John R. Tappert, Acting Director
Division of Reactor Projects

Docket Nos. 50-336, 50-423
License No. DPR-65, NPF-49

Enclosure: Millstone Inspection/Activity Plan

cc w/encl: Distribution via ListServ

The enclosed inspection plan details the inspections, less those related to physical protection, scheduled through June 30, 2013. Routine inspections performed by resident inspectors are not included in the inspection plan. In addition to the baseline inspections, the NRC will perform Temporary Instruction (TI) 2515/182, "Review of the Implementation of the Industry Initiative to Control Degradation of Underground Piping," in July 2012. The inspections listed during the last nine months of the inspection plan are tentative and may be revised at the mid-cycle performance review. The NRC provides the inspection plan to allow for the resolution of any scheduling conflicts and personnel availability issues. The NRC will contact you as soon as possible to discuss changes to the inspection plan should circumstances warrant any changes.

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Please contact Dr. Ronald R. Bellamy at (610) 337-5200 with any questions you have regarding this letter.

Sincerely,
/***RA***/
John R. Tappert, Acting Director
Division of Reactor Projects

Docket Nos. 50-336, 50-423
License No. DPR-65, NPF-49

Enclosure: Millstone Inspection/Activity Plan

cc w/encl: Distribution via ListServ

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DRS Branch Chiefs (6)
N. McNamara, SLO
D. Tifft, SLO
D. Screnci, PAO,
N. Sheehan, PAO
ROPassessment Resource
RidsNrrDirslpabResource
RidsNRRPM Millstone Resource
RidsNRRDorlLpl1-2 Resource
ROPreportsResource

DOCUMENT NAME: S:\ROP-12 EOC Review\Branch 5\Millstone\2011 Annual Assessment Letter MS Rev 0.docx
ADAMS ACCESSION NUMBER**: ML12061A240**

| ☑ SUNSI Review | | ☑ Non-Sensitive<br>☐ Sensitive | | ☑ Publicly Available<br>☐ Non-Publicly Available | |
|---|---|---|---|---|---|
| OFFICE | RI/DRP | RI/DRP | RI/DRP | | |
| NAME | TSetzer | RBellamy | JTappert | | |
| DATE | 02/28/12 | 02/28/12 | 02/28/12 | | |

OFFICIAL RECORD COPY

# Millstone
## Inspection / Activity Plan
## 01/01/2012 - 06/30/2013

| Unit Number | Planned Dates Start | End | Inspection Activity | Title | No. of Staff on Site |
|---|---|---|---|---|---|
| | | | **EP** | **- EP ANNUAL REPORT** | **4** |
| 2, 3 | 06/30/2012 | 12/31/2012 | IP 7111406 | Drill Evaluation | |
| | | | **TI-177** | **- MANAGING GAS ACCUMULATION IN ECCS** | **3** |
| 2, 3 | 01/30/2012 | 02/03/2012 | IP 2515/177 | Managing Gas Accumulation In Emergency Core Cooling, Decay Heat Removal & Containment Spray System | |
| | | | **71124** | **- OCC RAD SAFETY** | **1** |
| 2, 3 | 02/27/2012 | 03/02/2012 | IP 71124.01 | Radiological Hazard Assessment and Exposure Controls | |
| 2, 3 | 02/27/2012 | 03/02/2012 | IP 71124.02 | Occupational ALARA Planning and Controls | |
| 2, 3 | 02/27/2012 | 03/02/2012 | IP 71124.04 | Occupational Dose Assessment | |
| | | | **INSP** | **- OPERATION OF AN ISFSI** | **1** |
| 2, 3 | 04/01/2012 | 08/30/2012 | IP 60855 | Operation Of An ISFSI | |
| | | | **7111121** | **- CDBI** | **9** |
| 2, 3 | 04/16/2012 | 04/20/2012 | IP 7111121 | Component Design Bases Inspection | |
| 2, 3 | 04/30/2012 | 05/04/2012 | IP 7111121 | Component Design Bases Inspection | |
| 2, 3 | 05/07/2012 | 05/11/2012 | IP 7111121 | Component Design Bases Inspection | |
| | | | **EP EX** | **- EP EXERCISE EVALUATION** | **5** |
| 2, 3 | 06/21/2012 | 08/28/2012 | IP 7111401 | Exercise Evaluation | |
| 2, 3 | 08/19/2012 | 08/24/2012 | IP 71151 | Performance Indicator Verification | |
| | | | **TI 182** | **- DEGRADATION OF UNDERGROUND PIPING** | **1** |
| 2, 3 | 07/09/2012 | 07/13/2012 | IP 2515/182 | Review of the Implementation of the Industry Initiative to Control Degradation of Underground Piping | |
| | | | **71152B** | **- PI&R** | **5** |
| 2, 3 | 07/16/2012 | 07/20/2012 | IP 71152B | Problem Identification and Resolution | |
| 2 | 07/30/2012 | 08/03/2012 | IP 71152B | Problem Identification and Resolution | |
| | | | **71124** | **- RADWASTE** | **1** |
| 2, 3 | 07/23/2012 | 07/27/2012 | IP 71124.08 | Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation | |
| | | | **7111111B** | **- MS2 ON-SITE REQUAL INSP W/ P/F RESULTS** | **2** |
| 2 | 09/17/2012 | 09/21/2012 | IP 7111111B | Licensed Operator Requalification Program | |
| | | | **71124** | **- HP INSTRUMENTATION** | **1** |
| 2, 3 | 09/10/2012 | 09/14/2012 | IP 71124.05 | Radiation Monitoring Instrumentation | |
| | | | **7111108P** | **- UNIT 2 INSERVICE INSPECTION** | **1** |
| 2 | 10/15/2012 | 10/26/2012 | IP 7111108P | Inservice Inspection Activities - PWR | |
| | | | **71124** | **- OCC RADIATION SAFETY** | **1** |
| 3 | 10/22/2012 | 10/26/2012 | IP 60855 | Operation Of An ISFSI | |
| 2, 3 | 10/22/2012 | 10/26/2012 | IP 71124.01 | Radiological Hazard Assessment and Exposure Controls | |

This report does not include INPO and OUTAGE activities.
This report shows only on-site and announced inspection procedures.

# Millstone
## Inspection / Activity Plan
## 01/01/2012 - 06/30/2013

| Unit Number | Planned Dates Start | End | Inspection Activity | Title | No. of Staff on Site |
|---|---|---|---|---|---|
| | | | **71124** | **- OCC RADIATION SAFETY** | **1** |
| 2, 3 | 10/22/2012 | 10/26/2012 | IP 71124.02 | Occupational ALARA Planning and Controls | |
| 2, 3 | 10/22/2012 | 10/26/2012 | IP 71124.03 | In-Plant Airborne Radioactivity Control and Mitigation | |
| 2, 3 | 10/22/2012 | 10/26/2012 | IP 71124.04 | Occupational Dose Assessment | |
| | | | **71124** | **- OCC RAD SAFETY** | **1** |
| 2, 3 | 11/04/2012 | 11/09/2012 | IP 71124.01 | Radiological Hazard Assessment and Exposure Controls | |
| 2, 3 | 11/04/2012 | 11/09/2012 | IP 71124.02 | Occupational ALARA Planning and Controls | |
| 2, 3 | 11/04/2012 | 11/09/2012 | IP 71124.03 | In-Plant Airborne Radioactivity Control and Mitigation | |
| 2, 3 | 11/04/2012 | 11/09/2012 | IP 71124.04 | Occupational Dose Assessment | |
| | | | **MODS** | **- PERMANENT PLANT MODIFICATIONS** | **3** |
| 2, 3 | 01/28/2013 | 02/01/2013 | IP 7111117T | Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications | |
| 2, 3 | 02/11/2013 | 02/15/2013 | IP 7111117T | Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications | |
| | | | **EP PROGR** | **- EP PROGRAM INSPECTION** | **1** |
| 2, 3 | 02/11/2013 | 02/15/2013 | IP 7111402 | Alert and Notification System Testing | |
| 2, 3 | 02/11/2013 | 02/15/2013 | IP 7111403 | Emergency Preparedness Organization Staffing and Augmentation System | |
| 2, 3 | 02/11/2013 | 02/15/2013 | IP 7111404 | Emergency Action Level and Emergency Plan Changes | |
| 2 | 02/11/2013 | 02/15/2013 | IP 7111405 | Correction of Emergency Preparedness Weaknesses and Deficiencies | |
| | | | **7111108P** | **- U3 INSERVICE INSPECTION** | **1** |
| 3 | 04/15/2013 | 04/26/2013 | IP 7111108P | Inservice Inspection Activities - PWR | |
| | | | **71124** | **- OCC RADIATION SAFETY** | **1** |
| 2, 3 | 04/22/2013 | 04/26/2013 | IP 71124.01 | Radiological Hazard Assessment and Exposure Controls | |
| 2, 3 | 04/22/2013 | 04/26/2013 | IP 71124.02 | Occupational ALARA Planning and Controls | |
| | | | **71124** | **- RADIO EFFLUENTS** | **1** |
| 2, 3 | 05/06/2013 | 05/10/2013 | IP 71124.06 | Radioactive Gaseous and Liquid Effluent Treatment | |
| | | | **71124** | **- REMP** | **1** |
| 2, 3 | 05/20/2013 | 05/24/2013 | IP 71124.07 | Radiological Environmental Monitoring Program | |

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 12, 2012

EA-12-049

All Power Reactor Licensees and
Holders of Construction Permits in
Active or Deferred Status

SUBJECT: ISSUANCE OF ORDER TO MODIFY LICENSES WITH REGARD TO REQUIREMENTS FOR MITIGATION STRATEGIES FOR BEYOND-DESIGN-BASIS EXTERNAL EVENTS

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Order that modifies the current license for your facility. The Order requires provisions for mitigation strategies for beyond-design-basis external events, and applies to all addressees listed in Attachment 1 to the enclosed Order.

Following the earthquake and tsunami at the Fukushima Dai-ichi nuclear power plant in March 2011, the NRC established a senior-level task force referred to as the Near-Term Task Force (NTTF). The NTTF conducted a systematic and methodical review of the NRC regulations and processes to determine if the agency should make safety improvements in light of the events in Japan. As a result of this review, the NTTF issued SECY-11-0093, "Near-Term Report and Recommendations for Agency Actions Following the Events in Japan," Agencywide Documents Access and Management System (ADAMS) Accession No. ML11186A950. SECY-11-0124, "Recommended Actions to be Taken Without Delay from the Near-Term Task Force Report," ADAMS Accession No. ML112911571 and SECY-11-0137, "Prioritization of Recommended Actions to be Taken in Response to Fukushima Lessons Learned," ADAMS Accession No.ML11272A111 were issued to establish the NRC staff's prioritization of the recommendations. Recommendation 4.2 concerning mitigation strategies was determined to be a high-priority action. This Order is based upon the NTTF recommendation.

The events at Fukushima Dai-ichi highlight the possibility that extreme natural phenomena could challenge the prevention, mitigation and emergency preparedness defense-in-depth layers. At Fukushima, limitations in time and unpredictable conditions associated with the accident significantly challenged attempts by the responders to preclude core damage and containment failure. During the events in Fukushima, the challenges faced by the operators were beyond any faced previously at a commercial nuclear reactor. It was determined that additional requirements must be imposed to mitigate beyond-design-basis external events. These additional requirements impose guidance and strategies to be available if the loss of power, motive force and normal access to the ultimate heat sink to prevent fuel damage in the reactor and spent fuel pool affected all units at a site simultaneously.

The NRC staff has determined that continued operation does not pose an imminent risk to public health and safety; however, the additional requirements outlined in this Order are necessary in light of insights gained from the events at Fukushima Dai-ichi. The requirements of this Order are immediately effective and are expected to remain in place until superseded by Order or rule.

Pursuant to Section 223 of the Atomic Energy Act of 1954, as amended, any person who willfully violates, attempts to violate, or conspires to violate, any provision of this Order shall be subject to criminal prosecution as set forth in that section. Violation of this order may also subject the person to civil monetary penalty.

The enclosed Order requires responses and actions within specified timeframes. Please contact your Licensing Project Manager or Mr. Steven Bloom, Mitigation Strategies Order Project Manager (301-415-2431), regarding any issues related to compliance with the requirements in the enclosed Order, or if you have other questions.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. The NRC also includes significant enforcement actions on its Web site at (http://www.nrc.gov/reading-rm/doc-collections/enforcement/actions/. The enclosed Order has been forwarded to the Office of the *Federal Register* for publication.

Sincerely,

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation

Michael R. Johnson, Director
Office of New Reactors

Enclosure:
Order (EA-12-049)

cc: Listserv

ORDER TO MODIFYING LICENSES WITH REGARD TO REQUIREMENTS FOR MITIGATION STRATEGIES FOR BEYOND-DESIGN-BASIS EXTERNAL EVENTS
EA-12-049

Enclosure

7590-01-P

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

| | | |
|---|---|---|
| In the Matter of | ) | |
| | ) | |
| ALL POWER REACTOR | ) | Docket Nos. (as shown in Attachment 1) |
| LICENSEES AND HOLDERS | ) | License Nos. (as shown in Attachment 1) or |
| OF CONSTRUCTION PERMITS IN | ) | Construction Permit Nos. (as shown in |
| ACTIVE OR DEFERRED STATUS | ) | Attachment 1) ) |
| | ) | |
| | ) | EA-12-049 |

# ORDER MODIFYING LICENSES WITH REGARD TO REQUIREMENTS FOR MITIGATION STRATEGIES FOR BEYOND-DESIGN-BASIS EXTERNAL EVENTS (EFFECTIVE IMMEDIATELY)

I.

The Licensees and construction permits (CP) holders[1] identified in Attachment 1 to this Order hold licenses and CPs issued by the U.S. Nuclear Regulatory Commission (NRC or Commission) authorizing operation and/or construction of nuclear power plants in accordance with the Atomic Energy Act of 1954, as amended, and Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," and Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants."

II.

On March 11, 2011, a magnitude 9.0 earthquake struck off the coast of the Japanese island of Honshu. The earthquake resulted in a large tsunami, estimated to have exceeded 14 meters (45 feet) in height, that inundated the Fukushima Dai-ichi nuclear power plant site.

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1 *CP holders, as used in this Order, includes CPs, in active or deferred status, as identified in Attachment 1 to this Order (i.e., Watts Bar, Unit 2; and Bellefonte, Units 1 and 2)*

The earthquake and tsunami produced widespread devastation across northeastern Japan and significantly affected the infrastructure and industry in the northeastern coastal areas of Japan.

When the earthquake occurred, Fukushima Dai-ichi Units 1, 2, and 3 were in operation and Units 4, 5, and 6 were shut down for routine refueling and maintenance activities. The Unit 4 reactor fuel was offloaded to the Unit 4 spent fuel pool (SFP). Following the earthquake, the three operating units automatically shut down and offsite power was lost to the entire facility. The emergency diesel generators (EDGs) started at all six units providing alternating current (ac) electrical power to critical systems at each unit. The facility response to the earthquake appears to have been normal.

Approximately 40 minutes following the earthquake and shutdown of the operating units, the first large tsunami wave inundated the site, followed by additional waves. The tsunami caused extensive damage to site facilities and resulted in a complete loss of all ac electrical power at Units 1 through 5, a condition known as station blackout. In addition, all direct current electrical power was lost early in the event on Units 1 and 2 and after some period of time at the other units. Unit 6 retained the function of one air-cooled EDG. Despite their actions, the operators lost the ability to cool the fuel in the Unit 1 reactor after several hours, in the Unit 2 reactor after about 70 hours, and in the Unit 3 reactor after about 36 hours, resulting in damage to the nuclear fuel shortly after the loss of cooling capabilities.

Following the events at the Fukushima Dai-ichi nuclear power plant, the NRC established a senior-level agency task force referred to as the Near-Term Task Force (NTTF). The NTTF was tasked with conducting a systematic and methodical review of the NRC regulations and processes and determining if the agency should make additional improvements to these programs in light of the events at Fukushima Dai-ichi. As a result of this review, the NTTF developed a comprehensive set of recommendations, documented in SECY-11-0093, "Near-Term Report and Recommendations for Agency Actions Following the Events in Japan,"

dated July 12, 2011. These recommendations were enhanced by the NRC staff following interactions with stakeholders. Documentation of the staff's efforts is contained in SECY-11-0124, "Recommended Actions to be Taken Without Delay From the Near-Term Task Force Report," dated September 9, 2011, and SECY-11-0137, "Prioritization of Recommended Actions to be Taken in Response to Fukushima Lessons Learned," dated October 3, 2011.

As directed by the Commission's staff requirements memorandum (SRM) for SECY-11-0093, the NRC staff reviewed the NTTF recommendations within the context of the NRC's existing regulatory framework and considered the various regulatory vehicles available to the NRC to implement the recommendations. SECY-11-0124 and SECY-11-0137 established the staff's prioritization of the recommendations based upon the potential safety enhancements.

Since receiving the Commission's direction in SRM-SECY-11-0124 and SRM-SECY-11-0137, the NRC staff conducted public meetings to discuss enhanced mitigation strategies intended to maintain or restore core cooling, containment, and SFP cooling capabilities following beyond-design-basis external events. At these meetings, the industry described its proposal for a Diverse and Flexible Mitigation Capability (FLEX), as documented in the Nuclear Energy Institute's (NEI's) letter dated December 16, 2011 (Agency Documents Access and Management System (ADAMS) Accession No. ML11353A008). FLEX is proposed as a strategy to fulfill the key safety functions of core cooling, containment integrity, and spent fuel cooling. Stakeholder input influenced the staff to pursue a more performance-based approach to improve the safety of operating power reactors than envisioned in NTTF Recommendation 4.2, SECY-11-0124, and SECY-11-0137.

Current regulatory requirements and existing plant capabilities allow the NRC to conclude that a sequence of events such as the Fukushima Dai-ichi accident is unlikely to occur in the U.S. Therefore, continued operation and continued licensing activities do not pose an imminent threat to public health and safety. However, NRC's assessment of new insights from the events at

Fukushima Dai-ichi leads the staff to conclude that additional requirements must be imposed on Licensees or CP holders to increase the capability of nuclear power plants to mitigate beyond-design-basis external events. These additional requirements are needed to provide adequate protection to public health and safety, as set forth in Section III of this Order.

Guidance and strategies required by this Order would be available if the loss of power, motive force, and normal access to the ultimate heat sink to prevent fuel damage in the reactor and SFP, affected all units at a site simultaneously. This Order requires a three-phase approach for mitigating beyond-design-basis external events. The initial phase requires the use of installed equipment and resources to maintain or restore core cooling, containment, and SFP cooling. The transition phase requires providing sufficient, portable, onsite equipment and consumables to maintain or restore these functions until they can be accomplished with resources brought from off site. The final phase requires obtaining sufficient offsite resources to sustain those functions indefinitely.

Additional details on an acceptable approach for complying with this Order will be contained in final Interim Staff Guidance (ISG) scheduled to be issued by the NRC in August 2012. This guidance will also include a template to be used for the plan that will be submitted in accordance with Section IV, Condition C.1 below.

III.

Reasonable assurance of adequate protection of the public health and safety and assurance of the common defense and security are the fundamental NRC regulatory objectives. Compliance with NRC requirements plays a critical role in giving the NRC confidence that Licensees or CP holders are maintaining an adequate level of public health and safety and common defense and security. While compliance with NRC requirements presumptively assures adequate protection, new information may reveal that additional requirements are

warranted. In such situations, the Commission may act in accordance with its statutory authority under Section 161 of the Atomic Energy Act of 1954, as amended, to require Licensees or CP holders to take action in order to protect health and safety and common defense and security.

To protect public health and safety from the inadvertent release of radioactive materials, the NRC's defense-in-depth strategy includes multiple layers of protection: (1) prevention of accidents by virtue of the design, construction, and operation of the plant; (2) mitigation features to prevent radioactive releases should an accident occur; and (3) emergency preparedness programs that include measures such as sheltering and evacuation. The defense-in-depth strategy also provides for multiple physical barriers to contain the radioactive materials in the event of an accident. The barriers are the fuel cladding, the reactor coolant pressure boundary, and the containment. These defense-in-depth features are embodied in the existing regulatory requirements and thereby provide adequate protection of the public health and safety.

Following the events of September 11, 2001, the NRC issued Order EA-02-026, dated February 25, 2002, which required Licensees to develop mitigating strategies related to the key safety functions of core cooling, containment, and SFP cooling. NEI Document 06-12, "B.5.b Phase 2 & 3 Submittal Guideline" (ADAMS Accession No. ML070090060) provides guidelines that describe the necessary mitigating strategies. The NRC endorsed these guidelines in a letter dated December 22, 2006, designated as Official Use Only. Those mitigating strategies were developed in the context of a localized event that was envisioned to challenge portions of a single unit. The events at Fukushima, however, demonstrate that beyond-design-basis external events may adversely affect: (1) more than one unit at a site with two or more units, and (2) multiple safety functions at each of several units located on the same site.

The events at Fukushima further highlight the possibility that extreme natural phenomena could challenge the prevention, mitigation, and emergency preparedness defense-in-depth layers. To address the uncertainties associated with beyond-design-basis external events, the

NRC is requiring additional defense-in-depth measures at licensed nuclear power reactors so that the NRC can continue to have reasonable assurance of adequate protection of public health and safety in mitigating the consequences of a beyond-design-basis external event.

The strategies and guidance developed and implemented by Licensees or CP holders in response to the requirements imposed by this Order will provide the necessary capabilities to supplement those of the permanently installed plant structures, systems, and components that could become unavailable following beyond-design-basis external events. These strategies and guidance will enhance the safety and preparedness capabilities established following September 11, 2001, and codified as 10 CFR 50.54(hh)(2). In order to address the potential for more widespread effects of beyond design basis external events, this Order requires strategies with increased capacity to implement protective actions concurrently at multiple units at a site. The strategies shall be developed to add multiple ways to maintain or restore core cooling, containment and SFP cooling capabilities in order to improve the defense-in-depth of licensed nuclear power reactors.

The Commission has determined that ensuring adequate protection of public health and safety requires that power reactor Licensees and CP holders develop, implement and maintain guidance and strategies to restore or maintain core cooling, containment, and SFP cooling capabilities in the event of a beyond-design-basis external event. These new requirements provide a greater mitigation capability consistent with the overall defense-in-depth philosophy, and, therefore, greater assurance that the challenges posed by beyond-design-basis external events to power reactors do not pose an undue risk to public health and safety. In order to provide reasonable assurance of adequate protection of public health and safety, all operating reactor licenses and CPs under Part 50 identified in Attachment 1 to this Order shall be modified to include the requirements identified in Attachment 2 to this Order. All combined licenses

(COLs) under 10 CFR Part 52 identified in Attachment 1 to this Order shall be modified to include the requirements identified in Attachment 3 to this Order.

Accordingly, the NRC has concluded that these measures are necessary to ensure adequate protection of public health and safety under the provisions of the backfit rule, 10 CFR 50.109(a)(4)(ii), and is requiring Licensee or CP holder action. In addition, pursuant to 10 CFR 2.202, the NRC finds that the public health, safety and interest require that this Order be made immediately effective.

IV.

Accordingly, pursuant to Sections 161b, 161i, 161o, and 182 of the Atomic Energy Act of 1954, as amended, and the Commission's regulations in 10 CFR 2.202, and 10 CFR Parts 50 and 52, IT IS HEREBY ORDERED, EFFECTIVE IMMEDIATELY, THAT ALL LICENSES AND CONSTRUCTION PERMITS IDENTIFIED IN ATTACHMENT 1 TO THIS ORDER ARE MODIFIED AS FOLLOWS:

A. 1. All holders of CPs issued under Part 50 shall, notwithstanding the provisions of any Commission regulation or CPs to the contrary, comply with the requirements described in Attachment 2 to this Order except to the extent that a more stringent requirement is set forth in the CP. These CP holders shall complete full implementation **prior to issuance of an operating license.**

2. All holders of operating licenses issued under Part 50 shall, notwithstanding the provisions of any Commission regulation or license to the contrary, comply with the requirements described in Attachment 2 to this Order except to the extent that a more stringent requirement is set forth in the license. These Licensees shall promptly start implementation of the requirements in Attachment 2 to the Order and shall complete full implementation **no later than two (2) refueling cycles**

**after submittal of the overall integrated plan, as required in Condition C.1.a, or December 31, 2016, whichever comes first.**

3. All holders of COLs issued under Part 52 shall, notwithstanding the provisions of any Commission regulation or license to the contrary, comply with the requirements described in Attachment 3 to this Order except to the extent that a more stringent requirement is set forth in the license. These Licensees shall promptly start implementation of the requirements in Attachment 3 to the Order and shall complete full implementation prior to initial fuel load.

B. 1. All Licensees and CP holders shall, within **twenty (20) days** of the date of this Order, notify the Commission, (1) if they are unable to comply with any of the requirements described in Attachment 2 or Attachment 3, (2) if compliance with any of the requirements is unnecessary in their specific circumstances, or (3) if implementation of any of the requirements would cause the Licensee or CP holder to be in violation of the provisions of any Commission regulation or the facility license. The notification shall provide the Licensee's or CP holder's justification for seeking relief from or variation of any specific requirement.

2. Any Licensee or CP holder that considers that implementation of any of the requirements described in Attachment 2 or Attachment 3 to this Order would adversely impact safe and secure operation of the facility must notify the Commission, within **twenty (20) days** of this Order, of the adverse safety impact, the basis for its determination that the requirement has an adverse safety impact, and either a proposal for achieving the same objectives specified in Attachment 2 or Attachment 3 requirement in question, or a schedule for modifying the facility to address the adverse safety condition. If neither approach is appropriate, the Licensee or CP holder must supplement its response to Condition B.1 of this Order

to identify the condition as a requirement with which it cannot comply, with attendant justifications as required in Condition B.1.

C. 1. a. All holders of operating licenses issued under Part 50 shall by **February 28, 2013**, submit to the Commission for review an overall integrated plan including a description of how compliance with the requirements described in Attachment 2 will be achieved.

b. All holders of CPs issued under Part 50 or COLs issued under Part 52 shall, within **one (1) year** after issuance of the final ISG, submit to the Commission for review an overall integrated plan including a description of how compliance with the requirements described in Attachment 2 or Attachment 3 will be achieved.

2. All Licensees and holders of CPs shall provide an initial status report **sixty (60) days** following issuance of the final ISG and at **six (6)-month** intervals following submittal of the overall integrated plan, as required in Condition C.1, which delineates progress made in implementing the requirements of this Order.

3. All Licensees and CP holders shall report to the Commission when full compliance with the requirements described in Attachment 2 or Attachment 3 is achieved.

Licensee or CP holders responses to Conditions B.1, B.2, C.1, C.2, and C.3, above shall be submitted in accordance with 10 CFR 50.4 and 10 CFR 52.3, as applicable.

As applicable, the Director, Office of Nuclear Reactor Regulation or the Director, Office of New Reactors may, in writing, relax or rescind any of the above conditions upon demonstration by the Licensee or CP holder of good cause.

V.

In accordance with 10 CFR 2.202, the Licensee or CP holder must, and any other person adversely affected by this Order may, submit an answer to this Order, and may request a hearing on this Order, **within 20 days** of the date of this Order. Where good cause is shown, consideration will be given to extending the time to answer or to request a hearing. A request for extension of time in which to submit an answer or request a hearing must be made in writing to the Director, Office of Nuclear Reactor Regulation or to the Director, Office of New Reactors, U.S. Nuclear Regulatory Commission, Washington, DC 20555, and include a statement of good cause for the extension. The answer may consent to this Order.

If a hearing is requested by a Licensee, CP holder or a person whose interest is adversely affected, the Commission will issue an Order designating the time and place of any hearings. If a hearing is held, the issue to be considered at such hearing shall be whether this Order should be sustained. Pursuant to 10 CFR 2.202(c)(2)(i), the licensee, CP holder or any other person adversely affected by this Order, may, in addition to demanding a hearing, at the time the answer is filed or sooner, move the presiding officer to set aside the immediate effectiveness of the Order on the ground that the Order, including the need for immediate effectiveness, is not based on adequate evidence but on mere suspicion, unfounded allegations, or error.

All documents filed in NRC adjudicatory proceedings, including a request for hearing, a petition for leave to intervene, any motion or other document filed in the proceeding prior to the submission of a request for hearing or petition to intervene, and documents filed by interested governmental entities participating under 10 CFR 2.315(c), must be filed in accordance with the NRC E-Filing rule (72 FR 49139, August 28, 2007). The E-Filing process requires participants to submit and serve all adjudicatory documents over the internet, or in some cases to mail copies on electronic storage media. Participants may not submit paper copies of their filings unless they seek an exemption in accordance with the procedures described below.

To comply with the procedural requirements of E-Filing, at least 10 days prior to the filing deadline, the participant should contact the Office of the Secretary by e-mail at hearing.docket@nrc.gov, or by telephone at (301) 415-1677, to request (1) a digital ID certificate, which allows the participant (or its counsel or representative) to digitally sign documents and access the E-Submittal server for any proceeding in which it is participating; and (2) advise the Secretary that the participant will be submitting a request or petition for hearing (even in instances in which the participant, or its counsel or representative, already holds an NRC-issued digital ID certificate). Based upon this information, the Secretary will establish an electronic docket for the hearing in this proceeding if the Secretary has not already established an electronic docket.

Information about applying for a digital ID certificate is available on NRC's public Web site at *http://www.nrc.gov/site-help/e-submittals/apply-certificates.html*. System requirements for accessing the E-Submittal server are detailed in NRC's "Guidance for Electronic Submission," which is available on the agency's public Web site at *http://www.nrc.gov/site-help/esubmittals.html*. Participants may attempt to use other software not listed on the web site, but should note that the NRC's E-Filing system does not support unlisted software, and the NRC Meta System Help Desk will not be able to offer assistance in using unlisted software.

If a participant is electronically submitting a document to the NRC in accordance with the E-Filing rule, the participant must file the document using the NRC's online, web-based submission form. In order to serve documents through the Electronic Information Exchange, users will be required to install a web browser plug-in from the NRC web site. Further information on the web-based submission form, including the installation of the Web browser plug-in, is available on the NRC's public Web site at *http://www.nrc.gov/site-help/esubmittals.html*.

Once a participant has obtained a digital ID certificate and a docket has been created, the participant can then submit a request for hearing or petition for leave to intervene. Submissions

should be in Portable Document Format (PDF) in accordance with NRC guidance available on the NRC public Web site at *http://www.nrc.gov/site-help/e-submittals.html*. A filing is considered complete at the time the documents are submitted through the NRC's E-Filing system. To be timely, an electronic filing must be submitted to the E-Filing system no later than 11:59 p.m. Eastern Time on the due date. Upon receipt of a transmission, the E-Filing system time-stamps the document and sends the submitter an e-mail notice confirming receipt of the document. The E-Filing system also distributes an e-mail notice that provides access to the document to the NRC Office of the General Counsel and any others who have advised the Office of the Secretary that they wish to participate in the proceeding, so that the filer need not serve the documents on those participants separately. Therefore, applicants and other participants (or their counsel or representative) must apply for and receive a digital ID certificate before a hearing request/petition to intervene is filed so that they can obtain access to the document via the E-Filing system.

A person filing electronically using the agency's adjudicatory E-Filing system may seek assistance by contacting the NRC Meta System Help Desk through the "Contact Us" link located on the NRC Web site at *http://www.nrc.gov/site-help/e-submittals.html*, by e-mail at MSHD.Resource@nrc.gov, or by a toll-free call at (866) 672-7640. The NRC Meta System Help Desk is available between 8 a.m. and 8 p.m., Eastern Time, Monday through Friday, excluding government holidays.

Participants who believe that they have a good cause for not submitting documents electronically must file an exemption request, in accordance with 10 CFR 2.302(g), with their initial paper filing requesting authorization to continue to submit documents in paper format. Such filings must be submitted by: (1) first class mail addressed to the Office of the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, Attention: Rulemaking and Adjudications Staff; or (2) courier, express mail, or expedited delivery service to the Office of the Secretary, Sixteenth Floor, One White Flint North, 11555 Rockville Pike,

Rockville, Maryland, 20852, Attention: Rulemaking and Adjudications Staff. Participants filing a document in this manner are responsible for serving the document on all other participants. Filing is considered complete by first-class mail as of the time of deposit in the mail, or by courier, express mail, or expedited delivery service upon depositing the document with the provider of the service. A presiding officer, having granted an exemption request from using E-Filing, may require a participant or party to use E-Filing if the presiding officer subsequently determines that the reason for granting the exemption from use of E-Filing no longer exists.

Documents submitted in adjudicatory proceedings will appear in NRC's electronic hearing docket, which is available to the public at *http://ehd.nrc.gov/EHD_Proceeding/home.asp*, unless excluded pursuant to an order of the Commission, or the presiding officer. Participants are requested not to include personal privacy information, such as social security numbers, home addresses, or home phone numbers in their filings, unless an NRC regulation or other law requires submission of such information. With respect to copyrighted works, except for limited excerpts that serve the purpose of the adjudicatory filings and would constitute a Fair Use application, participants are requested not to include copyrighted materials in their submission.

If a person other than the Licensee or CP holder requests a hearing, that person shall set forth with particularity the manner in which his interest is adversely affected by this Order and shall address the criteria set forth in 10 CFR 2.309(d).

In the absence of any request for hearing, or written approval of an extension of time in which to request a hearing, the provisions specified in Section IV above shall be final twenty (20) days from the date of this Order without further order or proceedings. If an extension of time for requesting a hearing has been approved, the provisions specified in Section IV shall be final when the extension expires if a hearing request has not been received. AN ANSWER OR A REQUEST FOR HEARING SHALL NOT STAY THE IMMEDIATE EFFECTIVENESS OF THIS ORDER.

FOR THE NUCLEAR REGULATORY COMMISSION

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation

Michael R. Johnson, Director
Office of New Reactors

Dated this 12th day of March 2012

POWER REACTOR LICENSEES AND HOLDERS OF
CONSTRUCTION PERMITS IN ACTIVE OR DEFERRED STATUS

Arkansas Nuclear One
Entergy Operations, Inc.
Docket Nos. 50-313 and 50-368
License Nos. DPR-51 and NPF-6

Mr. Christopher J. Schwarz
Vice President, Operations
Entergy Operations, Inc.
Arkansas Nuclear One
1448 S.R. 333
Russellville, AR 72802

Beaver Valley Power Station
First Energy Nuclear Operating Co.
Docket Nos. 50-334 and 50-412
License Nos. DPR-66 and NPF-73

Mr. Paul A. Harden
Site Vice President
FirstEnergy Nuclear Operating Company
Mail Stop A-BV-SEB1
P.O. Box 4, Route 168
Shippingport, PA 15077

Bellefonte Nuclear Power Station
Tennessee Valley Authority
Docket Nos. 50-438 and 50-439
Construction Permit Nos. CPPR No. 122 and CPPR No. 123

Mr. Michael D. Skaggs
Senior Vice President, Nuclear Generation Development and Construction
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Braidwood Station
Exelon Generation Co., LLC
Docket Nos. STN 50-456 and STN 50-457
License Nos. NPF-72 and NPF-77

Mr. Michael J. Pacilio
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

Browns Ferry Nuclear Plant
Tennessee Valley Authority
Docket Nos. 50-259, 50-260 and 50-296
License Nos. DPR-33, DPR-52 and DPR-68

Mr. Preston D. Swafford
Chief Nuclear Officer and Executive Vice President
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Brunswick Steam Electric Plant
Carolina Power & Light Co.
Docket Nos. 50-325 and 50-324
License Nos. DPR-71 and DPR-62

Mr. Michael J. Annacone
Vice President
Carolina Power & Light Company
Brunswick Steam Electric Plant
P. O. Box 10429
Southport, NC 28461

Byron Station
Exelon Generation Co., LLC
Docket Nos. STN 50-454 and STN 50-455
License Nos. NPF-37 and NPF-66

Mr. Michael J. Pacilio
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

Callaway Plant
Union Electric Co.
Docket No. 50-483
License No. NPF-30

Mr. Adam C. Heflin
Senior Vice President and Chief Nuclear Officer
Union Electric Company
P. O. Box 620
Fulton, MO 65251

Calvert Cliffs Nuclear Power Plant
Calvert Cliffs Nuclear Power Plant, LLC
Docket Nos. 50-317 and 50-318
License Nos. DPR-53 and DPR-69

Mr. George H. Gellrich
Vice President
Calvert Cliffs Nuclear Power Plant, LLC
Calvert Cliffs Nuclear Power Plant
1650 Calvert Cliffs Parkway
Lusby, MD 20657-4702

Catawba Nuclear Station
Duke Energy Carolinas, LLC
Docket Nos. 50-413 and 50-414
License Nos. NPF-35 and NPF-52

Mr. James R. Morris
Site Vice President
Duke Energy Carolinas, LLC
Catawba Nuclear Station
4800 Concord Road
York, SC 29745

Clinton Power Station
Exelon Generation Co., LLC
Docket No. 50-461
License No. NPF-62

Mr. Michael J. Pacilio
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

Columbia Generating Station
Energy Northwest
Docket No. 50-397
License No. NPF-21

Mr. Mark E. Reddemann
Chief Executive Officer
Energy Northwest
MD 1023
P.O. Box 968
Richland, WA 99352

Comanche Peak Nuclear Power Plant
Luminant Generation Co., LLC
Docket Nos. 50-445 and 50-446
License Nos. NPF-87 and NPF-89

Mr. Rafael Flores
Senior Vice President and Chief Nuclear Officer
Luminant Generation Company, LLC
Attn: Regulatory Affairs
P. O. Box 1002
Glen Rose, TX 76043

Cooper Nuclear Station
Nebraska Public Power District
Docket No. 50-298
License No. DPR-46

Mr. Brian J. O'Grady
Vice President - Nuclear and Chief Nuclear Officer
Nebraska Public Power District
72676 648A Avenue
P.O. Box 98
Brownville, NE 68321

Crystal River Nuclear Generating Plant
Florida Power Corp.
Docket No. 50-302
License No. DPR-72

Mr. Jon A. Franke
Vice President
Attn: Supervisor, Licensing & Regulatory Affairs
Progress Energy, Inc.
Crystal River Nuclear Plant (NA2C)
15760 West Power Line Street
Crystal River, FL 34428-6708

Davis-Besse Nuclear Power Station
First Energy Nuclear Operating Co.
Docket No. 50-346
License No. NPF-3

Mr. Barry S. Allen
Site Vice President
FirstEnergy Nuclear Operating Company
c/o Davis-Besse NPS
5501 N. State Route 2
Oak Harbor, OH 43449-9760

Diablo Canyon Power Plant
Pacific Gas & Electric Co.
Docket Nos. 50-275 and 50-323
License Nos. DPR-80 and DPR-82

Mr. John T. Conway
Senior Vice President - Energy Supply and Chief Nuclear Officer
Pacific Gas and Electric Company
Diablo Canyon Power Plant
77 Beale Street, Mail Code B32
San Francisco, CA 94105

Donald C. Cook Nuclear Plant
Indiana Michigan Power Co.
Docket Nos. 50-315 and 50-316
License Nos. DPR-58 and DPR-74

Mr. Lawrence J. Weber
Senior Vice President and Chief Nuclear Officer
Indiana Michigan Power Company
Nuclear Generation Group
One Cook Place
Bridgman, MI 49106

Dresden Nuclear Power Station
Exelon Generation Co., LLC
Docket Nos. 50-237 and 50-249
License Nos. DPR-19 and DPR-25

Mr. Michael J. Pacilio
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

Duane Arnold Energy Center
NextEra Energy Duane Arnold, LLC
Docket No. 50-331
License No. DPR-49

Mr. Peter Wells
Site Vice President
NextEra Energy
Duane Arnold Energy Center
3277 DAEC Road
Palo, IA 52324-9785

Edwin I. Hatch Nuclear Plant
Southern Nuclear Operating Co.
Docket Nos. 50-321 and 50-366
License Nos. DPR-57 and NPF-5

Mr. Dennis R. Madison
Vice President
Southern Nuclear Operating Company, Inc.
Edwin I. Hatch Nuclear Plant
11028 Hatch Parkway North
Baxley, GA 31513

Fermi
Detroit Edison Co.
Docket No. 50-341
License No. NPF-43

Mr. Jack M. Davis
Senior Vice President and Chief Nuclear Officer
Detroit Edison Company
Fermi 2 – 210 NOC
6400 North Dixie Highway
Newport, MI 48166

Fort Calhoun Station
Omaha Public Power District
Docket No. 50-285
License No. DPR-40

Mr. David J. Bannister
Vice President and Chief Nuclear Officer
Omaha Public Power District
444 South 16th St. Mall
Omaha, NE 68102-2247

Grand Gulf Nuclear Station
Entergy Operations, Inc.
Docket No. 50-416
License No. NPF-29

Mr. Michael Perito
Vice President, Operations
Entergy Operations, Inc.
Grand Gulf Nuclear Station, Unit 1
7003 Bald Hill Road
Port Gibson, MS 39150

H. B. Robinson Steam Electric Plant
Carolina Power & Light Co.
Docket No. 50-261
License No. DPR-23

Mr. Robert J. Duncan II
Vice President
Carolina Power & Light Company
3581 West Entrance Road
Hartsville, SC 29550

Hope Creek Generating Station
PSEG Nuclear, LLC
Docket No. 50-354
License No. NPF-57

Mr. Thomas Joyce
President and Chief Nuclear Officer
PSEG Nuclear LLC - N09
P. O. Box 236
Hancocks Bridge, NJ 08038

Indian Point Energy Center
Entergy Nuclear Operations, Inc.
Docket Nos. 50-247 and 50-286
License Nos. DPR-26 and DPR-64

Mr. John Ventosa
Vice President, Operations
Entergy Nuclear Operations, Inc.
Indian Point Energy Center
450 Broadway, GSB
P.O. Box 249
Buchanan, NY 10511-0249

James A. FitzPatrick Nuclear Power Plant
Entergy Nuclear Operations, Inc.
Docket No. 50-333
License No. DPR-59

Mike Colomb
Vice President, Operations
Entergy Nuclear Operations, Inc.
James A. FitzPatrick Nuclear Power Plant
P.O. Box 110
Lycoming, NY 13093

Joseph M. Farley Nuclear Plant
Southern Nuclear Operating Co.
Docket Nos. 50-348 and 50-364
License Nos. NPF-2 and NPF-8

Mr. Tom Lynch
Vice President - Farley
Southern Nuclear Operating Company, Inc.
Joseph M. Farley Nuclear Plant
7388 North State Highway 95
Columbia, AL 36319

Kewaunee Power Station
Dominion Energy Kewaunee, Inc.
Docket No. 50-305
License No. DPR-43

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Energy Kewaunee, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

LaSalle County Station
Exelon Generation Co., LLC
Docket Nos. 50-373 and 50-374
License Nos. NPF-11 and NPF-18

Mr. Michael J. Pacilio
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

Limerick Generating Station
Exelon Generation Co., LLC
Docket Nos. 50-352 and 50-353
License Nos. NPF-39 and NPF-85

Mr. Michael J. Pacilio
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

Millstone Nuclear Power Station
Dominion Nuclear Connecticut, Inc.
Docket Nos. 50-336 and 50-423
License Nos. DPR-65 and NPF-49

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Nuclear Connecticut, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

Monticello Nuclear Generating Plant
Northern States Power Company
Docket No. 50-263
License No. DPR-22

Mr. Timothy J. O'Connor
Site Vice President
Northern States Power Company - Minnesota
Monticello Nuclear Generating Plant
2807 West County Road 75
Monticello, MN 55362-9637

Nine Mile Point Nuclear Station
Nine Mile Point Nuclear Station, LLC
Docket Nos. 50-220 and 50-410
License Nos. DPR-63 and NPF-69

Mr. Ken Langdon
Vice President Nine Mile Point
Nine Mile Point Nuclear Station, LLC
P. O. Box 63
Lycoming, NY 13093

North Anna Power Station
Virginia Electric & Power Co.
Docket Nos. 50-338 and 50-339
License Nos. NPF-4 and NPF-7

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Nuclear
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

Oconee Nuclear Station
Duke Energy Carolinas, LLC
Docket Nos. 50-269, 50-270 and 50-287
License Nos. DPR-38, DPR-47 and DPR-55

Mr. Preston Gillespie
Site Vice President, Oconee Nuclear Station
Duke Energy Carolinas, LLC
7800 Rochester Highway
Seneca, SC 29672

Oyster Creek Nuclear Generating Station
Exelon Generation Co., LLC
Docket No. 50-219
License No. DPR-16

Mr. Michael J. Pacilio
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

Palisades Nuclear Plant
Entergy Nuclear Operations, Inc.
Docket No. 50-255
License No. DPR-20

Mr. Anthony J. Vitale
Site Vice President - Palisades
Entergy Nuclear Operations, Inc.
Palisades Nuclear Plant
27780 Blue Star Memorial Highway
Covert, MI 49043

Palo Verde Nuclear Generating Station
Arizona Public Service Company
Docket Nos. STN 50-528, STN 50-529 and STN 50-530
License Nos. NPF-41, NPF-51 and NPF-74

Mr. Randall K. Edington
Executive Vice President Nuclear and Chief Nuclear Officer
Arizona Public Service Co.
P. O. Box 52034, MS 7602
Phoenix, AZ 85072-2034

Peach Bottom Atomic Power Station
Exelon Generation Co., LLC
Docket Nos. 50-277 and 50-278
License Nos. DPR-44 and DPR-56

Mr. Michael J. Pacilio
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

Perry Nuclear Power Plant
First Energy Nuclear Operating Co.
Docket No. 50-440
License No. NPF-58

Mr. Vito A. Kaminskas
Site Vice President - Nuclear - Perry
FirstEnergy Nuclear Operating Company
Perry Nuclear Power Plant
10 Center Road, A290
Perry, OH 44081

Pilgrim Nuclear Power Station Unit No. 1
Entergy Nuclear Operations, Inc.
Docket No. 50-293
License No. DPR-35

Mr. Robert Smith
Vice President and Site Vice President
Entergy Nuclear Operations, Inc.
Pilgrim Nuclear Power Station
600 Rocky Hill Road
Plymouth, MA 02360-5508

Point Beach Nuclear Plant
NextEra Energy Point Beach, LLC
Docket Nos. 50-266 and 50-301
License Nos. DPR-24 and DPR-27

Mr. Larry Meyer
Site Vice President
NextEra Energy Point Beach, LLC
Point Beach Nuclear Plant, Units 1 & 2
6610 Nuclear Road
Two Rivers, WI 54241-9516

Prairie Island Nuclear Generating Plant
Northern States Power Co. Minnesota
Docket Nos. 50-282 and 50-306
License Nos. DPR-42 and DPR-60

Mr. Mark A. Schimmel
Site Vice President
Northern States Power Company - Minnesota
Prairie Island Nuclear Generating Plant
1717 Wakonade Drive East
Welch, MN 55089-9642

Quad Cities Nuclear Power Station
Exelon Generation Co., LLC
Docket Nos. 50-254 and 50-265
License Nos. DPR-29 and DPR-30

Mr. Michael J. Pacilio
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

R. E. Ginna Nuclear Power Plant
R.E. Ginna Nuclear Power Plant, LLC
Docket No. 50-244
License No. DPR-18

Mr. Joseph E. Pacher
Vice President
R.E. Ginna Nuclear Power Plant, LLC
R.E. Ginna Nuclear Power Plant
1503 Lake Road
Ontario, NY 14519

River Bend Station
Entergy Operations, Inc.
Docket No. 50-458
License No. NPF-47

Mr. Eric W. Olson
Vice President, Operations
Entergy Operations, Inc.
River Bend Station
5485 U.S. Highway 61N
St. Francisville, LA 70775

Salem Nuclear Generating Station
PSEG Nuclear, LLC
Docket Nos. 50-272 and 50-311
License Nos. DPR-70 and DPR-75

Mr. Thomas Joyce
President and Chief Nuclear Officer
PSEG Nuclear LLC - N09
P. O. Box 236
Hancocks Bridge, NJ 08038

San Onofre Nuclear Generating Station
Southern California Edison Co.
Docket Nos. 50-361 and 50-362
License Nos. NPF-10 and NPF-15

Mr. Peter T. Dietrich
Senior Vice President and Chief Nuclear Officer
Southern California Edison Company
San Onofre Nuclear Generating Station
P. O. Box 128
San Clemente, CA 92674-0128

Seabrook
NextEra Energy Seabrook, LLC
Docket No. 50-443
License No. NPF-86

Mr. Paul Freeman
Site Vice President
NextEra Energy Seabrook, LLC
c/o Mr. Michael O'Keefe
NextEra Energy Seabrook, LLC
P.O. Box 300
Seabrook, NH 03874

Sequoyah Nuclear Plant
Tennessee Valley Authority
Docket Nos. 50-327 and 50-328
License Nos. DPR-77 and DPR-79

Mr. Preston D. Swafford
Chief Nuclear Officer and Executive Vice President
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Pursuant to Section 223 of the Atomic Energy Act of 1954, as amended, any person who willfully violates, attempts to violate, or conspires to violate, any provision of this Order shall be subject to criminal prosecution as set forth in that section. Violation of this order may also subject the person to civil monetary penalty.

The enclosed Order requires responses and actions within specified timeframes. Please contact your Licensing Project Manager or Mr. Steven Bloom, Mitigation Strategies Order Project Manager (301-415-2431), regarding any issues related to compliance with the requirements in the enclosed Order, or if you have other questions.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. The NRC also includes significant enforcement actions on its Web site at (http://www.nrc.gov/reading-rm/doc-collections/enforcement/actions/. The enclosed Order has been forwarded to the Office of the *Federal Register* for publication.

Sincerely,

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation

Michael R. Johnson, Director
Office of New Reactors

Enclosure:
Order (EA-12-049)

cc: Listserv

Distribution: See next page

**ADAMS Accession No.:** ML12054A736 *e-mail concurrence

| **OFFICE** | PM: NRR/JLD | LA: NRR/JLD | QTE* | BC: NRR/JLD | OGC* |
|---|---|---|---|---|---|
| **NAME** | SBloom | SRohrer | JDoughterty | RPascarelli | CSafford |
| **DATE** | 03/12/2012 | 03/12/2012 | 02/05/2012 | 03/11/2012 | 03/10/2012 |
| **OFFICE** | D: JLD* | OD: OE* | OD: NRO | OD: NRR | |
| **NAME** | DSkeen | RZimmerman (NHilton for) | MJohnson | ELeeds | |
| **DATE** | 03/11/2012 | 03/09/2012 | 03/ 12 /2012 | 03/ 12 /2012 | |

**OFFICIAL RECORD COPY**

**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
**WASHINGTON, D.C. 20555-0001**

March 12, 2012

LICENSEE: DOMINION NUCLEAR CONNECTICUT, INC.

FACILITY: MILLSTONE POWER STATION, UNIT NO. 2

SUBJECT: SUMMARY OF FEBRUARY 15, 2012, PRE-APPLICATION MEETING WITH DOMINION NUCLEAR CONNECTICUT, INC., TO DISCUSS A PROPOSED MILLSTONE POWER STATION, UNIT NO. 2, LICENSE AMENDMENT REQUEST CONCERNING SPENT FUEL POOL CRITICALITY RE-ANALYSIS (TAC NO. ME7943)

On February 15, 2012, a Category 1 public meeting was held between the U.S. Nuclear Regulatory Commission (NRC) staff and representatives of Dominion Nuclear Connecticut, Inc. (DNC or the licensee) at NRC Headquarters, One White Flint North, 11555 Rockville Pike, Rockville, Maryland. The purpose of the meeting was to discuss a proposed Millstone Power Station, Unit No. 2, (Millstone 2) License Amendment Request (LAR) concerning spent fuel pool criticality re-analysis. Enclosed is a list of attendees.

DNC representatives presented information regarding the proposed LAR. A copy of the presentation can be found in the Agencywide Documents Access and Management System (ADAMS) at Accession No. ML120450552. During the meeting, DNC discussed the current status of the Millstone 2 spent fuel pool and the proposed changes that will be addressed in a future LAR submittal.

In addition to the information presented by DNC, NRC staff stated that the licensee should consider inclusion of the following information in their LAR:

- an analysis of a fuel assembly-misplacement accident scenario, or a probability of occurrence analysis that shows that the accident scenario is not credible with the use of cell blockers;
- an analysis showing that there will be no gas entrapment caused by Boraflex, or an analysis of the gas entrapment caused; Boraflex should be modeled appropriately based on these analyses;
- all of the qualitative data from the TRITON validation study;
- a study of isotopic modeling including a sensitivity study to demonstrate the method used is conservative;
- a new analysis of existing accident and event scenarios (e.g., fuel drop, seismic, fuel handling, etc.) or existing accident analysis should be shown to be bounding;
- an analysis of a fuel rod misplacement outside the spent fuel pool rack or demonstration that a misplacement is physically impossible;
- a discussion on how the borated stainless steel rods are modeled;
- a sensitivity study on the effect of Gadolinium in the spent fuel pool;
- specifically address any rod inserts that are currently in fuel assemblies in the spent fuel pool;
- an analysis addressing the effects of any consolidated fuel in the spent fuel pool; and,

- address whether an increase or decrease is the limiting physical tolerance factor in storage cell inside diameter, rack pitch, and cell wall thickness.

The NRC staff also discussed that the use of the Electric Power Research Institute (EPRI) fuel depletion benchmarks to validate TRITON could potentially affect the time needed to review the LAR. Normally, the EPRI fuel depletion benchmarks would have been reviewed in a Topical Report that includes conditions that must be addressed before use. A Topical Report has not yet been written for the EPRI fuel depletion benchmarks; therefore, an extensive review by the NRC staff may be needed depending on the extent DNC uses them.

The NRC staff intends to publish guidance on the validation of depletion codes in the near future. The NRC staff stated that this guidance should be taken into consideration by DNC before submitting their LAR.

During the meeting, the NRC staff reviewed Staff Guidance DSS-ISG 2010-01, "Interim Staff Guidance Regarding the Nuclear Criticality Safety Analysis for Spent Fuel Pools," to ensure that DNC understood what would be expected in the LAR. This Interim Staff Guidance can be found in ADAMS at Accession No. ML110620086.

DNC expressed interest in having another public meeting with the NRC staff before submitting the proposed LAR.

Members of the public were in attendance. One member of the public, Nancy Burton from the Connecticut Coalition Against Millstone, asked a question of the NRC staff. The question was in regard to the AREVA fuel assemblies that were discussed during the meeting and whether or not that type of fuel assembly was similar to the test assembly used at Catawba Nuclear Station (Catawba) a few years ago which encountered unexpected problems during use. The unexpected problems include an elongation of the fuel assemblies.

The AREVA fuel design to be used at Millstone 2 is significantly different than the design used at Catawba. Based on operational experience to date, there is no indication of excessive growth in the fuel bundle design planned for use in Millstone 2.

Another member of the public, Dale Lancaster from Nuclearconsultants.com, had a couple of comments for the NRC. In his first comment, Mr. Lancaster discussed NUREG/CR-6760, "Study of the Effect of Integral Burnable Absorbers for PWR [Pressurized Water Reactor] Burnup Credit," which states that it is conservative to ignore gadolinium build up when doing an analysis of the spent fuel pool. He stated that Westinghouse did studies on burnable neutron absorbers which showed that gadolinium has a negative worth which is a penalty and not a positive effect since the isotope has a large cross section.

In his second comment, Mr. Lancaster stated that the 5% burn-up uncertainty that DNC is using when doing their calculation against the EPRI fuel depletion benchmarks and fuel management is more than enough. With this uncertainty, DNC will show about 3 to 4 times as much burn-up as they will find. He stated that this should allow them to do the review without a Topical Report being completed on the EPRI fuel depletion benchmarks.

Public Meeting Feedback forms were not received.

Please direct any inquiries to me at 301-415-1603, or Carleen.Sanders@nrc.gov.

Carleen J. Sanders, Project Manager
Plant Licensing Branch I-2
Division of Operating Licensing Regulation
Office of Nuclear Reactor Regulation

Docket No. 50-336

Enclosure:
List of Attendees

cc w/enclosure: Distribution via Listserv

LIST OF ATTENDEES

FEBRUARY 15, 2012

MEETING WITH DOMINION NUCLEAR CONNECTICUT, INC.

MILLSTONE POWER STATION, UNIT NO. 2 PRE-SUBMITTAL MEETING

| NAME | ORGANIZATION |
|---|---|
| Carleen Sanders | NRC |
| Meena Khanna | NRC |
| Jeff Whited | NRC |
| Kent Wood | NRC |
| Emma Wong | NRC |
| Wanda Craft | Dominion |
| William D. Bartron | Dominion |
| Tom Schleicher | Dominion |
| John Guerci | Dominion |
| Rick MacManus | Dominion |
| Bob Hall | Dominion |
| Steve Thompson | Dominion |
| Nancy Burton | Connecticut Coalition Against Millstone |
| Dale Lancaster | Nuclear Consultants.com |
| Glenn Adams | Xcel Energy |

Enclosure

Please direct any inquiries to me at 301-415-1603, or Carleen.Sanders@nrc.gov.

*/ra/*

Carleen J. Sanders, Project Manager
Plant Licensing Branch I-2
Division of Operating Licensing Regulation
Office of Nuclear Reactor Regulation

Docket No. 50-336

Enclosure:
List of Attendees

cc w/enclosure: Distribution via Listserv

DISTRIBUTION:

| | | |
|---|---|---|
| PUBLIC | RidsNrrPMMillstone Resource | EWong, NRR |
| Branch Reading | RidsOgcRp Resource | KWood, NRR |
| RidsAcrsAcnw_MailCTR Resource | RidsRgn1MailCenter Resource | JWhited, NRR |
| RidsNrrDorlLpli-2 Resource | RidsNrrLAABaxter Resource | LChang, EDO Region 1 |

**ADAMS Accession No. PKG: ML120580179** Meeting Notice: ML120320028
Meeting Summary: ML120580362

| OFFICE | DORL/LPLI-2/PM | DORL/LPLI-2/PM | DSS/SRXB/SFT/TL | DORL/LPLI-2/LA | DORL/LPLI-2/BC | DORL/LPLI-2/PM |
|---|---|---|---|---|---|---|
| NAME | JWhited | CSanders | KWood | ABaxter | MKhanna | CSanders |
| DATE | 03/07/2012 | 03/08/2012 w/ comments | 03/07/2012 | 03/07/2012 | 03/12/2012 w/ comments | 03/12/2012 |

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 12, 2012

All Power Reactor Licensees and
Holders of Construction Permits in
Active or Deferred Status

SUBJECT: REQUEST FOR INFORMATION PURSUANT TO TITLE 10 OF THE *CODE OF FEDERAL REGULATIONS* 50.54(f) REGARDING RECOMMENDATIONS 2.1, 2.3, AND 9.3, OF THE NEAR-TERM TASK FORCE REVIEW OF INSIGHTS FROM THE FUKUSHIMA DAI-ICHI ACCIDENT

This letter is being issued in accordance with the provisions of Sections 161.c, 103.b, and 182.a of the Atomic Energy Act of 1954, as amended (the Act), and the U.S. Nuclear Regulatory Commission (NRC or Commission) regulation in Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.54(f). Pursuant to these provisions of the Act or this regulation, you are required to provide further information to support the evaluation of the NRC staff recommendations for the Near-Term Task Force (NTTF) review of the accident at the Fukushima Dai-ichi nuclear facility. The review will enable the staff to determine whether the nuclear plant licenses under your responsibility should be modified, suspended, or revoked. For combined license (COL) holders under 10 CFR Part 52, the issues in NTTF Recommendation 2.1 and 2.3 regarding seismic and flooding reevaluations and walkdowns are resolved. Therefore, COL holders are not required to respond to Enclosures 1 through 4 of this letter. Similarly, information requests in Enclosures 3 and 4 are not applicable to holders of construction permits under 10 CFR Part 50. Operating power reactor licensees under 10 CFR Part 50 are required to respond to all of the information requests.

## BACKGROUND

Following the accident at the Fukushima Dai-ichi nuclear power plant resulting from the March 11, 2011, Great Tōhoku Earthquake and subsequent tsunami, the NRC established the NTTF in response to Commission direction. The NTTF Charter, dated March 30, 2011, tasked the NTTF with conducting a systematic and methodical review of NRC processes and regulations and determining if the agency should make additional improvements to its regulatory system. Ultimately, a comprehensive set of recommendations contained in a report to the Commission (dated July 12, 2011, SECY-11-0093 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML111861807)) was developed using a decision rationale built around the defense-in-depth concept in which each level of defense-in-depth (namely prevention, mitigation, and emergency preparedness (EP)) is critically evaluated for its completeness and effectiveness in performing its safety function.

The current regulatory approach, and the resultant plant capabilities, gave the NTTF and the NRC the confidence to conclude that an accident with consequences similar to the Fukushima accident is unlikely to occur in the United States (U.S.). The NRC concluded that continued plant operation and the continuation of licensing activities did not pose an imminent risk to public health and safety.

On August 19, 2011, following issuance of the NTTF report, the Commission directed the NRC staff in staff requirements memorandum (SRM) for SECY-11-0093 (ADAMS Accession No. ML112310021), in part, to determine which of the recommendations could and should be implemented without unnecessary delay.

On September 9, 2011, the NRC staff provided SECY-11-0124 to the Commission (ADAMS Accession No. ML11245A158). The document identified those actions from the NTTF report that should be taken without unnecessary delay. As part of the October 18, 2011, SRM for SECY-11-0124 (ADAMS Accession No. ML112911571), the Commission approved the staff's proposed actions, including the development of three information requests under 10 CFR 50.54(f). The information collected would be used to support the NRC staff's evaluation of whether further regulatory action was needed in the areas of seismic and flooding design, and EP.

On December 23, 2011, the Consolidated Appropriations Act, Public Law 112-074, was signed into law. Section 402 of the law also requires a reevaluation of licensees' design basis for external hazards, and expands the scope to include other external events, as described below:

> The Nuclear Regulatory Commission shall require reactor licensees to re-evaluate the seismic, tsunami, flooding, and other external hazards at their sites against current applicable Commission requirements and guidance for such licensees as expeditiously as possible, and thereafter when appropriate, as determined by the Commission, and require each licensee to respond to the Commission that the design basis for each reactor meets the requirements of its license, current applicable Commission requirements and guidance for such license. Based upon the evaluations conducted pursuant to this section and other information it deems relevant, the Commission shall require licensees to update the design basis for each reactor, if necessary.

Reevaluation of the design basis with respect to other external events will be requested later as a separate action from this letter. However, licensees are encouraged to consider this when performing the Recommendation 2.3 walkdowns for flooding.

In the context of Recommendation 2.1 of this 10 CFR 50.54(f) letter, the NRC staff definition of vulnerability[1] is broad enough to capture both prevention and mitigation aspects and also include features of protection such as hardware, procedures, temporary measures, and potentially available off-site resources. Such a definition allows both licensees and the NRC staff to assess plant response to a natural hazard event as an integrated system providing consideration for all available resources. Information resulting from such an evaluation will help the staff decide upon the most appropriate regulatory action focusing on the most beneficial safety enhancements.

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[1] For the purpose of this document, plant-specific vulnerabilities are defined as those features important to safety that when subject to an increased demand due to the newly calculated hazard evaluation have not been shown to be capable of performing their intended safety functions.

ACTION

The NRC has concluded that it requires the information requested in the enclosures to this letter to verify the compliance with your plant's design basis and to determine if additional regulatory actions are appropriate. Therefore, you are required, pursuant to Section 182(a) of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f), to submit a response to this letter. You must confirm receipt of this letter within 30 days, however, each attachment contains a topic-specific schedule for response. Your response must be written and signed under oath or affirmation.

The NRC has provided information in each enclosure on acceptable approaches for responding to the information requests. Alternate approaches with appropriate justification will be considered.

This request contains information collection requirements that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). These information collections were approved by the Office of Management and Budget (OMB) under an expedited clearance, approval number 3150-0211, which expires September 30, 2012. Prior to the expiration date, the NRC will submit the collection to OMB for renewal.

The burden for these information collections is estimated to average 13,300 hours per response, as detailed in Table 1. This estimate includes the time for reviewing instructions, searching existing data sources, gathering data, performing necessary analyses, and completing and reviewing the collection of information. These estimates represent the average level of effort per plant; actual levels of effort may vary depending upon the results of the hazard analyses. Send comments regarding this burden estimate or any other aspect of these information collections, including suggestions for reducing the burden, to the Information Services Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by email to INFOCOLLECTS.RESOURCE@NRC.GOV; and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0211), Office of Management and Budget, Washington, DC 20503.

The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid OMB control number.

**Table 1 Burden Estimate (hours)**

| | Hazard Evaluation | Risk/Integrated Assessment | Walkdowns | EP Communications | EP Staffing |
|---|---|---|---|---|---|
| Enclosure 1 | 1700 | 3500 | N/A | N/A | N/A |
| Enclosure 2 | 1300 | 2700 | N/A | N/A | N/A |
| Enclosure 3 | N/A | N/A | 2000 | N/A | N/A |
| Enclosure 4 | N/A | N/A | 2000 | N/A | N/A |
| Enclosure 5 | N/A | N/A | N/A | 50 | 50 |

In accordance with 10 CFR 2.390, "public inspections, exemptions, and requests for withholding," a copy of this letter and your response will be made available for inspection and copying at the NRC Website at www.nrc.gov, and/or at the NRC Public Document Room. If you believe that any of the information to be submitted meets the criteria in 10 CFR 2.390 for withholding from public disclosure, you must include sufficient information, as required by the subsection, to support such a determination.

INFORMATION REQUEST JUSTIFICATION

Hazard Reevaluations and Walkdowns

Current NRC regulations and associated regulatory guidance provide a robust regulatory approach for the evaluation of site hazards associated with natural phenomena. However, this framework has evolved over time as new information regarding site hazards and the potential consequence has become available. As a result, the licensing basis, design, and level of protection from natural phenomena differ among the existing operating reactors in the U.S., depending on when the plant was constructed and licensed for operation. Additionally, the assumptions and factors that were considered in determining the level of protection necessary at these sites vary depending on a number of contributing factors. To date, the NRC has not undertaken a comprehensive re-establishment of the design basis for existing plants to reflect the current state of knowledge or current licensing criteria.

Protection from natural phenomena is critical for safe operation of nuclear power plants. Failure to protect structures, systems, and components (SSCs) important to safety from natural phenomena with appropriate safety margins has the potential to result in common-cause failures with significant consequences, as was demonstrated at Fukushima. Additionally, the consequences of an accident from some natural phenomena may be aggravated by a "cliff-edge" effect, in that a small increase in the hazard (e.g., flooding level) may sharply increase the number of SSCs affected.

As the state of knowledge of these hazards has evolved significantly since the licensing of many of the plants within the U.S., and given the demonstrated consequences from Fukushima, it is necessary to confirm the appropriateness of the hazards assumed for U.S. plants and their ability to protect against them.

In accordance with Commission direction, the NRC staff is implementing the following:

A hazard evaluation consistent with Recommendation 2.1 will be implemented in two phases as follows:

- Phase 1: Issue 10 CFR 50.54(f) letters to all licensees to request that they reevaluate the seismic and flooding hazards at their sites using updated seismic and flooding hazard information and present-day regulatory guidance and methodologies and, if necessary, to request they perform a risk evaluation. The evaluations associated with the requested information in this letter do not revise the design basis of the plant. This letter implements Phase 1.

- Phase 2: Based upon the results of Phase 1, the NRC staff will determine whether additional regulatory actions are necessary (e.g., update the design basis and SSCs important to safety) to provide additional protection against the updated hazards.

The NRC staff's goal is to complete Phase 1 and collect sufficient information to make a regulatory decision for most plants within five years. It is anticipated that collection of this information for all plants will take no longer than seven years.

Information collection on hazard protection walkdowns consistent with Recommendation 2.3 will be implemented in a single-phase. The results from these walkdowns are expected to capture any degraded, non-conforming conditions, and cliff-edge effects for flooding so that they are addressed by the licensee's corrective action program and will provide input to Recommendation 2.1. It is anticipated that this effort will be completed within approximately one year.

Emergency Preparedness

Further, if mitigation is not successful in preventing the release of radioactive materials from the plant, EP provides additional defense-in-depth to minimize exposure to radiation to the public. The accident at Fukushima reinforced the need for effective EP, the objective of which is to ensure the capability to implement effective measures to mitigate the consequences of a radiological emergency. The accident at Fukushima highlighted the need to determine and implement the required staff to fill all necessary positions responding to a multi-unit event. Additionally, there is a need to ensure that the communication equipment relied upon to coordinate the event response during a prolonged station blackout can be powered.

The reevaluation and related analysis being conducted under this request are justified by the need to enhance those EP measures that support the prevention or mitigation of core damage and uncontrolled release of radioactive material. The justification in this letter, as well as the background and discussions in each of its enclosures, provide the reasoning and justification for this request. Moreover, the reevaluation and related analysis will serve to meet NRC's obligation under the Consolidated Appropriations Act, for 2012 (*Pub Law 112-74*), Section 402, and also affords licensees the opportunity to inform the NRC regarding safety-related decisions.

If you have any questions on this matter, please contact your NRC licensing Project Manager.

Sincerely,

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation

Michael R. Johnson, Director
Office of New Reactors

Enclosures:
1. Recommendation 2.1: Seismic
2. Recommendation 2.1: Flooding
3. Recommendation 2.3: Seismic
4. Recommendation 2.3: Flooding
5. Recommendation 9.3: EP
6. Licensees and Holders of Construction Permits

cc: Listserv

RECOMMENDATION 2.1: SEISMIC

## PURPOSE

The U.S. Nuclear Regulatory Commission (NRC or Commission) is issuing this information request for the following purposes:

- To gather information with respect to Near-Term Task Force (NTTF) Recommendation 2.1, as directed by staff requirements memoranda (SRM) associated with SECY-11-0124 and SECY-11-0137, and the Consolidated Appropriations Act, for 2012 (*Pub Law 112-74*), Section 402, to reevaluate seismic hazards at operating reactor sites

- To collect information to facilitate NRC's determination if there is a need to update the design basis and systems, structures, and components (SSCs) important to safety to protect against the updated hazards at operating reactor sites

- To collect information with respect to the resolution of Generic Issue (GI) 199

Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.54(f), addressees are required to submit a written response to this information request.

## BACKGROUND

The SSCs important to safety in operating nuclear power plants are designed either in accordance with, or meet the intent of Appendix A to 10 CFR Part 100 and Appendix A to 10 CFR Part 50, General Design Criteria (GDC) 2. GDC 2 states that SSCs important to safety at nuclear power plants must be designed to withstand the effects of natural phenomena such as earthquakes, tornados, hurricanes, floods, tsunami, and seiches without loss of capability to perform their intended safety functions. The design bases for these SSCs reflect consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area. The design bases also reflect margin to account for the limited accuracy, quantity, and period of time in which the historical data have been accumulated.

In response to the accident at the Fukushima Dai-ichi nuclear power plant caused by the March 11, 2011, Tohoku earthquake and subsequent tsunami, the Commission established a NTTF to conduct a systematic review of NRC processes and regulations and to determine if the agency should make additional improvements to its regulatory system. The NTTF developed a set of recommendations intended to clarify and strengthen the regulatory framework for protection against natural phenomena. The purpose of this letter is to gather information with respect to NTTF Recommendation 2.1 for seismic hazards. Recommendation 2.1, as amended by the SRMs associated with SECY-11-0124 and SECY-11-0137, instructs the NRC staff to issue requests for information to licensees pursuant to Sections 161.c, 103.b, and 182.a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f). This information request is for licensees and holders of construction permits under 10 CFR Part 50 to reevaluate the seismic hazards at their sites against present-day NRC requirements and guidance. Based upon this information, the NRC staff will determine whether additional regulatory actions are necessary (e.g., update the design basis and SSCs important to safety) to protect against the updated hazards. In developing Recommendation 2.1, the NTTF recognized that the state of knowledge

of seismic hazard within the United States (U.S.) has evolved and the level of conservatism in the determination of the original seismic design bases should be reexamined.

Since the issuance of GDC 2, the NRC has developed new regulations, regulatory guidance, and several regulatory programs aimed at enhancements for previously licensed reactors. These regulatory programs for enhancements are described in Section 4.1.1 of the NTTF Report, "Recommendations for Enhancing Reactor Safety in the 21st Century." Two recent programs are the individual plant examinations of external events (IPEEEs) and GI-199, "Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants," dated June 9, 2005 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML051600272). The following paragraphs summarize these two programs.

Individual Plant Examination of External Events:

On June 28, 1991, the NRC issued Supplement 4 to Generic Letter (GL) 88-20, "Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities," (ADAMS Accession No. ML031150485). GL 88-20, referred to as the IPEEE program, requested that each licensee identify and report to the NRC all plant-specific vulnerabilities to severe accidents caused by external events. The IPEEE program included the following four supporting objectives:

(1) Develop an appreciation of severe accident behavior.

(2) Understand the most likely severe accident sequences that could occur at the licensee's plant under full-power operating conditions.

(3) Gain a qualitative understanding of the overall likelihood of core damage and fission product releases.

(4) Reduce, if necessary, the overall likelihood of core damage and radioactive material releases by modifying, where appropriate, hardware and procedures that would help prevent or mitigate severe accidents.

The external events to be considered in the IPEEE were: seismic events; internal fires; high winds, floods, and other external initiating events, including accidents related to transportation or nearby facilities and plant-unique hazards.

NUREG-1742, "Perspectives Gained from the Individual Plant Examination of External Events (IPEEE) Program," issued April, 2002 (ADAMS Accession Nos. ML021270070 and ML021270674), provides insights gained by the NRC from the IPEEE program. Almost all licensees reported in their IPEEE submittals that no plant vulnerabilities were identified with respect to seismic risk (the use of the term "vulnerability" varied widely among the IPEEE submittals). However, most licensees did report at least some seismic "anomalies," "outliers," or other concerns. In the few submittals that did identify a seismic vulnerability, the findings were comparable to those identified as outliers or anomalies in other IPEEE submittals. Seventy percent of the plants proposed improvements as a result of their seismic IPEEE analyses. In several responses, neither the IPEEE analyses nor subsequent assessments documented the

potential safety impacts of these improvements, and in most cases, plants have not reported completion of these improvements to the NRC.

Generic Issue 199:

In support of early site permits (ESPs) and combined licenses (COLs) for new reactors, the NRC staff reviewed updates to the seismic source and ground motion models provided by applicants. These seismic updates included new Electric Power Research Institute models to estimate earthquake ground motion and updated models for earthquake sources in the Central and Eastern United States (CEUS), such as those around Charleston, SC, and New Madrid, MO. These reviews identified higher seismic hazard estimates than previously assumed, which may result in an increased likelihood of exceeding the safe-shutdown earthquake (SSE) at operating facilities in the CEUS. The staff determined that based on the evaluations of the IPEEE program, seismic designs of operating plants in the CEUS do not pose an imminent safety concern. At the same time, the staff also recognized that because the probability of exceeding the SSE at some currently operating sites in the CEUS is higher than previously understood, further study was warranted. As a result, the staff concluded on May 26, 2005 (ADAMS Accession No. ML051450456), that the issue of increased seismic hazard estimates in the CEUS should be examined under the Generic Issues Program (GIP).

Generic Issue (GI)-199 was established on June 9, 2005 (ADAMS Accession No. ML051600272). The initial screening analysis for GI-199 suggested that estimates of the seismic hazard for some currently operating plants in the CEUS have increased. The NRC staff completed the initial screening analysis of GI-199 and held a public meeting in February 2008, (ADAMS Accession Nos. ML073400477 and ML080350189) concluding that GI-199 should proceed to the safety/risk assessment stage of the GIP.

Subsequently, during the safety/risk assessment stage of the GIP, the NRC staff reviewed and evaluated the new information received with the ESP/COL submittals, along with 2008 U.S. Geological Survey seismic hazard estimates. The staff compared the new seismic hazard data with the earlier evaluations conducted as part of the IPEEE program. The NRC staff completed the safety/risk assessment stage of GI-199 on September 2, 2010 (ADAMS Accession No. ML100270582), concluding that GI-199 should transition to the regulatory assessment stage of the GIP. The safety/risk assessment also concluded that (1) an immediate safety concern did not exist and (2) adequate protection of public health and safety was not challenged as a result of the new information. The NRC staff presented this conclusion at a public meeting held on October 6, 2010 (ADAMS Accession No. ML102950263). Information Notice 2010-018, "Generic Issue 199, 'Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants,'" dated September 2, 2010 (ADAMS Accession No. ML101970221), summarizes the results of the GI-199 safety/risk assessment.

For the GI-199 safety/risk assessment, the NRC staff evaluated the potential risk significance of the updated seismic hazards on seismic core damage frequency (SCDF) estimates. The changes in SCDF estimate in the safety/risk assessment for some plants lie in the range of $10^{-4}$ per year to $10^{-5}$ per year, which meet the numerical risk criteria for an issue to continue to the regulatory assessment stage of the GIP. However, as described in NUREG-1742, there are limitations associated with utilizing the inherently qualitative insights from the IPEEE submittals

in a quantitative assessment. In particular, the staff's assessment did not provide insight into which SSCs are important to seismic risk. Such knowledge is necessary for the NRC staff to determine, in light of the new understanding of seismic hazards, whether additional regulatory action is warranted.

## APPLICABLE REGULATORY REQUIREMENTS

- Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, GDC 2, "Design Bases for Protection against Natural Phenomena"
- 10 CFR 50.54, "Conditions of Licenses"
- 10 CFR 50.34(a)(1), (a)(3), (a)(4), (b)(1), (b)(2), and (b)(4)
- Appendix A, "Seismic and Geologic Siting Criteria for Nuclear Power Plants," to 10 CFR Part 100, "Reactor Site Criteria"
- 10 CFR 100.23, "Geological and Seismic Siting Criteria"

The seismic design bases for currently operating nuclear power plants were either developed in accordance with, or meet the intent of GDC 2 and 10 CFR Part 100, Appendix A. Although the regulatory requirements in Appendix A to 10 CFR Part 100 are fundamentally deterministic, the NRC process for determining the seismic design basis ground motions for new reactor applications after January 10, 1997, as described in 10 CFR 100.23, requires that uncertainties be addressed through an appropriate analysis such as a probabilistic seismic hazard analysis.

## DISCUSSION

Recommendation 2.1, as amended by the SRMs associated with SECY-11-0124 and SECY-11-0137, instructs the NRC staff to issue requests for licensees to reevaluate the seismic hazards at their sites using present-day NRC requirements and guidance, and identify actions that are planned to address plant-specific vulnerabilities[1] associated with the updated seismic hazards. Recommendation 2.1 for seismic hazards will be implemented in two phases as follows:

- Phase 1: Issue 10 CFR 50.54(f) letters to all licensees to reevaluate the seismic hazard at their sites using updated seismic hazard information and present-day regulatory guidance and methodologies and, if necessary, to perform a risk evaluation.
- Phase 2: If necessary, and based upon the results of Phase 1, determine whether additional regulatory actions are necessary (e.g., update the design basis and SSCs important to safety) to protect against the updated hazards.

[1] A definition of vulnerability in the context of this enclosure is as follows: Plant-specific vulnerabilities are those features important to safety that when subject to an increased demand due to the newly calculated hazard evaluation have not been shown to be capable of performing their intended safety functions.

To implement NTTF Recommendation 2.1, the staff is utilizing the general process developed for GI-199 as presented in the draft GL for GI-199 (ADAMS Accession No. ML11710783). This process, described in Attachment 1, asks each addressee to provide information about the current hazard and potential risk posed by seismic events using a progressive screening approach. Depending on the comparison between the reevaluated seismic hazard and the current design basis, the result is either no further risk evaluation or the performance of a seismic risk assessment. Risk assessment approaches acceptable to the staff include a seismic probabilistic risk assessment (SPRA), or a seismic margin assessment (SMA).

Present-day NRC requirements and guidance with respect to characterizing seismic hazards use a probabilistic approach in order to develop a risk-informed performance-based ground motion response spectrum (GMRS) for the site. This approach is described in Regulatory Guide (RG) 1.208, "A Performance-Based Approach to Define the Site-Specific Earthquake Ground Motion." RG 1.208 recommends the use of the Senior Seismic Hazard Analysis Committee (SSHAC) approach for treatment of expert judgment and quantifying uncertainty in order to develop seismic source and ground motion models for a Probabilistic Seismic Hazard Analysis used to develop the GMRS for a site.

The SMA approach should be the NRC SMA approach (e.g., NUREG/CR-4334, "An Approach to the Quantification of Seismic Margins in Nuclear Power Plants," issued in August 1985 (ADAMS Accession No. ML090500182) as enhanced for full-scope plants in NUREG-1407, "Procedural and Submittal Guidance for the Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities"). Part 10 of the American Society of Mechanical Engineers/American Nuclear Society standard (ASME/ANS), RA-Sa-2009, "Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications," provides an acceptable approach for determining the technical adequacy of the SMA approach used to respond to this information request. The SMA approach should include both core damage (accident prevention) and large early release (accident mitigation).

The NRC staff recommends that the SPRA approach at least be a Level 1 with an estimate of large early release frequency (LERF). By including containment performance and extending to Level 2 (including LERF) additional mitigation features that may be under consideration can be incorporated into the analyses. One acceptable approach for determining the technical adequacy of the SPRA is described in RG 1.200, Revision 2, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," (ADAMS Accession No. ML090410014) and ASME/ANS RA-Sa-2009). Consistent with the NRC's probabilistic risk assessment (PRA) policy statement, the technical adequacy of the methods used to develop the requested information must be sufficient to provide confidence in the results, such that the seismic risk information can be used in regulatory decision-making.

**REQUESTED ACTIONS**

Addressees are requested to perform a reevaluation of the seismic hazards at their sites using present-day NRC requirements and guidance to develop a GMRS. Recently, new consensus seismic source models for the CEUS (NUREG-2115, "Central and Eastern United States Seismic Source Characterization for Nuclear Facilities"), referred to as the Central and Eastern United States Seismic Source Characterization, have been completed using a SSHAC Level 3 process. Addressees whose plants are located in the CEUS will be able to use this new seismic

source model to characterize the hazard for their plants. Addressees whose plants lie in the Western United States (WUS) are requested to develop seismic source and ground motion models to characterize their regional and site-specific seismic hazards. Consistent with current practice for 10 CFR Part 52, new reactor licensing, WUS addressees should perform a SSHAC Level 3 study to develop a probabilistic seismic hazard analysis.

Addressees are requested to submit, along with the hazard evaluation, an interim evaluation and actions planned or taken to address the reevaluated hazard where it exceeds the current design basis.

While the seismic hazard reevaluation is being performed, NRC staff and stakeholders will continue interacting to develop strategies for screening, prioritization, and potential interim actions as well as implementation guidance for the risk evaluation. For plants where the reevaluated hazard exceeds the current design basis, addressees may opt to perform an SPRA. In addition, an SPRA, rather than a SMA, may be necessary for cases where the SMA screening tables are not usable due to a higher reevaluated hazard (i.e., GMRS). For all other plants where the reevaluated hazard exceeds the current design basis, the NRC will provide guidance on when an SMA option can be used. Factors that the staff will consider to determine whether an SPRA or an SMA is appropriate are (1) the extent to which the reevaluated hazard (GMRS) exceeds the current design basis (SSE), (2) the absolute seismic hazard based on an examination of the probabilistic seismic hazard curves for the site, and (3) previous estimates of plant capacity (e.g., IPEEE insights). The priority for the subsequent completion of the risk assessments by the addressees will also be based on the above factors. For example, as part of the GI-199 safety/risk assessment, the NRC staff found that assuming a factor of 1.3 times the SSE, combined with updated seismic hazard curves, distinguished between plants with lower and higher risk estimates.

Along with an assessment of reactor integrity, the NTTF recommended an evaluation of the spent fuel pool (SFP) integrity. The addressee's evaluation should consider all seismically induced failures that can lead to draining of the SFP. The evaluation should consider SFP walls, liner, penetrations (cooling water supplies or returns, drains), transfer gates and seals, seals and bellows between the SFP, transfer canal, and reactor cavity, sloshing effects (including loss of SFP inventory, wave-induced failures of gates, and subsequent flooding), siphon effects caused by cooling water pipe breaks, and other relevant effects that could lead to a significant loss of inventory of the SFP.

**REQUESTED INFORMATION**

The NRC requests that each addressee provide the following information (see Attachment 1 for additional details):

Seismic Hazard Evaluation

(1) site-specific hazard curves (common fractiles and mean) over a range of spectral frequencies and annual exceedance frequencies

(2) site-specific, performance-based GMRS developed from the new site-specific seismic hazard curves at the control point elevation(s)

(3) SSE ground motion values including specification of the control point elevation(s)

(4) comparison of the GMRS and SSE (if the GMRS is completely bounded by the SSE, an interim action plan or a risk evaluation is not necessary. However, if the GMRS exceeds the SSE only at higher frequencies information related to the functionality of high-frequency sensitive SSCs is requested. Attachment 1 provides further details)

(5) additional information such as insights from NTTF Recommendation 2.3 walkdown and estimates of plant seismic capacity developed from previous risk assessments to inform NRC screening and prioritization

(6) interim evaluation and actions taken or planned to address the higher seismic hazard relative to the design basis, as appropriate, prior to completion of the risk evaluation described below

(7) selected risk evaluation approach (if necessary)

Seismic Risk Evaluation

(8) SMA or SPRA (depending on criteria discussed above)

A. For plants that perform a SMA, the following information is requested:

(1) description of the methodologies used to quantify the seismic margins of high confidence of low probability of failure (HCLPF) capabilities of SSCs, together with key assumptions

(2) detailed list of the SSC seismic margin values with reference to the method of seismic qualification, the dominant failure modes, and the source of information

(3) for each analyzed SSC, the parameter values defining the seismic margin (e.g., the HCLPF capacity and any other parameter values such as the median acceleration capacity ($C_{50}$) and the logarithmic standard deviation or "beta" values) and the technical bases for the values

(4) general bases for screening SSCs

(5) description of the SMA, including the development of its logic models, the seismic response analysis, the results of the evaluation of containment performance, the results of the screening analysis, the results of the plant seismic walkdown, the identification of critical failure modes for each SSC, and the calculation of HCLPF capacities for each SSC included in the SMA logic model

(6) description of the process used to ensure that the SMA is technically adequate, including the dates and findings of peer reviews

(7) identified plant-specific vulnerabilities and actions planned or taken

B. For plants that perform a SPRA, the following information is requested:

(1) list of the significant contributors to SCDF for each seismic acceleration bin, including importance measures (e.g., Risk Achievement Worth, Fussell-Vesely and Birnbaum)

(2) a summary of the methodologies used to estimate the SCDF and LERF, including the following:

i. methodologies used to quantify the seismic fragilities of SSCs, together with key assumptions

ii. SSC fragility values with reference to the method of seismic qualification, the dominant failure mode(s), and the source of information

iii. seismic fragility parameters

iv. important findings from plant walkdowns and any corrective actions taken

v. process used in the seismic plant response analysis and quantification, including the specific adaptations made in the internal events PRA model to produce the seismic PRA model and their motivation

vi. assumptions about containment performance

(3) description of the process used to ensure that the SPRA is technically adequate, including the dates and findings of any peer reviews

(4) identified plant-specific vulnerabilities and actions that are planned or taken

(9) SFP Evaluation

A. description of the procedures used to evaluate the SFP integrity

B. results of the evaluation

C. identified actions that have been taken or that will be taken to address vulnerabilities associated with the SFP integrity

**REQUIRED RESPONSE**

In accordance with 10 CFR 50.54(f), an addressee must respond as described below:

1. Within 60 days of the date of the NRC's issuance of guidance on screening and prioritization criteria, and the implementation details of the risk assessment, each addressee is requested to submit: (1) its intention to follow the NRC-developed guidance[2], or (2) an alternative approach, including acceptance criteria.

2. Within 1.5 years of the date of this information request, each CEUS addressee is requested to submit a written response consistent with the requested information, seismic hazard evaluation, items 1 through 7 above. Within approximately 30 days of receipt of the last addressee submittal, the NRC staff will have determined the acceptability of the licensee's proposed risk evaluation approach, if necessary, and priority for completion.

3. Within 3 years of the date of this information request, each WUS addressee is requested to submit a written response consistent with the requested information, seismic hazard evaluation, items 1 through 7 above. Within approximately 30 days of receipt of the last addressee submittal, the NRC staff will have determined the acceptability of the licensee's proposed risk evaluation approach, if necessary, and priority for completion.

4. For hazard reevaluations that the NRC determines demonstrate the need for a higher priority, addressees are requested to complete the risk evaluation (items 8B and 9 above) over a period not to exceed 3 years from the date of the prioritization.

5. For hazard reevaluations that the NRC determines do not demonstrate the need for a higher priority, addressees are requested to complete the risk evaluation (items 8A or 8B and 9 above) over a period not to exceed 4 years from the date of the prioritization.

If an addressee cannot meet the requested response date, the addressee must provide a response within 90 days of the date of this information request and describe the alternative course of action that it proposes to take, including the basis of the acceptability of the proposed alternative course of action and estimated completion dates.

The required written response should be addressed to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, 11555 Rockville Pike, Rockville, MD 20852, under oath or affirmation under the provisions of Sections 161.c, 103.b, and 182.a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f). In addition, addressees should submit a copy of the response to the appropriate regional administrator.

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[2] The NRC staff will develop screening and prioritization criteria, and the implementation details of the risk assessment, including criteria for identifying vulnerabilities. This information is scheduled to be developed by November 30, 2012 and the NRC staff will interact with stakeholders, as appropriate during this process.

**Attachment 1 to Seismic Enclosure 1**

## Introduction

This Attachment describes an acceptable process for developing the information requested by the U.S. Nuclear Regulatory Commission (NRC). Figure 1 illustrates the process, which is based on a progressive screening approach. The following paragraphs provide additional discussion about each individual step in Figure 1.

**Step 1.** Addressees should develop site-specific base rock and control point elevation hazard curves (i.e., corresponding to fractile levels of 0.05, 0.16, 0.50, 0.84, and 0.95 and the mean) over a range of spectral frequencies (0.5 Hz, 1 Hz, 2.5 Hz, 5 Hz, 10 Hz, and 25 Hz and peak ground acceleration - PGA) and annual exceedance frequencies ($1 \times 10^{-6}$ and higher) determined from a probabilistic seismic hazard analysis (PSHA) as follows:

- Addressees of plants located in the Central and Eastern United States (CEUS) are expected to use the CEUS Seismic Source Characterization (CEUS-SSC) model (NUREG-2115, "Central and Eastern United States Seismic Source Characterization for Nuclear Facilities") and the appropriate Electric Power Research Institute (2004, 2006) ground motion prediction equations. Regional and local refinements of the CEUS-SSC are not necessary for this evaluation.

- Addressees of plants located in the Western United States (Columbia, Diablo Canyon, Palo Verde, and San Onofre) should develop an updated, site-specific PSHA. Any new or updated seismic hazard assessment should consider all relevant data, models, and methods in the evaluation of seismic sources and ground motion models. Consistent with Regulatory Guide (RG) 1.208, "A Performance-Based Approach to Define the Site-Specific Earthquake Ground Motion," addressees should use a Senior Seismic Hazard Analysis Committee (SSHAC) study, as described in NUREG/CR-6372, "Recommendations for Probabilistic Seismic Hazard Analysis: Guidance on Uncertainty and Use of Experts." Consistent with current practice, as described in NUREG-2117, "Practical Implementation Guidelines for SSHAC Level 3 and 4 Hazard Studies," a SSHAC Level 3 study should be performed.

- To remove non-damaging lower-magnitude earthquakes, addressees should either use a lower bound magnitude cutoff of moment magnitude ($M_w$) 5 or the cumulative absolute velocity (CAV) filter for the PSHA. The CAV filter should be limited to $M_w$ less than or equal to 5.5.

- Addressees should use site response methods 2 or 3, as described in NUREG/CR-6728, "Technical Basis for Revision of Regulatory Guidance on Design Ground Motions: Hazard- and Risk-consistent Ground Motion Spectra Guidelines." The dynamic site response should be determined through analyses based on either time history or random vibration theory. The subsurface site response model, for both soil and rock sites, should extend to sufficient depth to reach the generic rock conditions as defined in the ground motion models used in the PSHA. In addition, a randomization procedure should be used that appropriately represents the amount of subsurface information at a

- given site. In addition, the randomization procedure should accommodate the variability in soil depth (including depth to generic rock conditions), shear-wave velocities, layer thicknesses, and strain dependant nonlinear material properties at the site. Generally, at least 60 convolution analyses should be performed to define the mean and standard deviation of the site response. Site amplification curves should be developed over a broad range of annual exceedance frequencies ($1\times10^{-6}$ and higher) to facilitate estimation of seismic core damage frequency.

- Addresses should document the low- and high-frequency controlling earthquakes at frequencies of $10^{-4}$ and $10^{-5}$ per year.

- Addressees should use the site-specific hazard curves to develop a performance-based ground motion response spectrum (GMRS) for the site, using the guidance in RG 1.208. The site-specific GMRS should be determined and clearly specified at the same elevation as the design-basis safe shutdown earthquake (SSE) ground motion assuming a site profile with a free surface above the control point elevation.

**Step 2.** Addressees are requested to provide the new seismic hazard curves, the GMRS, and the SSE in graphical and tabular format. Addressees are also requested to provide soil profiles used in the site response analysis as well as the resulting soil amplification functions.

**Step 3.** If the SSE is greater than or equal to the GMRS at all frequencies between 1 and 10 Hz and at the PGA anchor point, then addressees may terminate the evaluation (Step 4)[3] after providing a confirmation, if necessary, that SSCs, which may be affected by high-frequency ground motion, will maintain their functions important to safety.

**Step 4.** This step demonstrates termination of the process for resolution of NTTF, Recommendation 2.1 for plants whose SSE is greater than the calculated GMRS.

**Step 5.** Based on NRC screening criteria, addressees will be requested to perform a seismic margins analysis (SMA) or a seismic probabilistic risk assessment (SPRA). If addressees perform an SPRA, then they are requested to follow Steps 6a and 7a. If addressees perform an SMA, then they are requested to follow Steps 6b and 7b.

**Step 6a.** It is requested that addressees that perform an SPRA ensure that the SPRA is technically adequate for regulatory decision making and includes an evaluation of containment performance and integrity. RG 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," provides an acceptable approach for determining the technical adequacy of an SPRA used to respond to this information request.

**Step 6b.** It is requested that addressees that perform an SMA use a composite spectrum review level earthquake, defined as the maximum of the GMRS and SSE at each spectral frequency. The SMA should also include an evaluation of containment performance and

[3] For plants with only a high frequency ground motion exceedance (above 10 Hz), the documentation should also include a confirmation that affected plant structures and equipment at various elevations will maintain their functions important to safety at the higher acceleration levels.

integrity. The American Society of Mechanical Engineers/American Nuclear Society (ASME/ANS) RA-Sa-2009 provides an acceptable approach for determining the technical adequacy of an SMA used to respond to this information request.

**Step 7a.** Document and submit the results of the SPRA to the NRC for review. The "Requested Information" section in the main body of Enclosure 1 identifies the specific information that is requested. In addition, addresses are requested to submit an evaluation of the SFP integrity.

**Step 7b.** Document and submit the results of the SMA to the NRC for review. The "Requested Information" section in the main body of Enclosure 1 identifies the specific information that is requested. In addition, addresses should submit an evaluation of the SFP integrity.

**Step 8.** Submit plans for actions that evaluate seismic risk contributors. NRC staff, industry, and other stakeholders will continue to interact to develop acceptance criteria in order to identify potential vulnerabilities.

**Step 9.** The information provided in Steps 6 through 8 will be evaluated in Phase 2 to consider any additional regulatory actions.

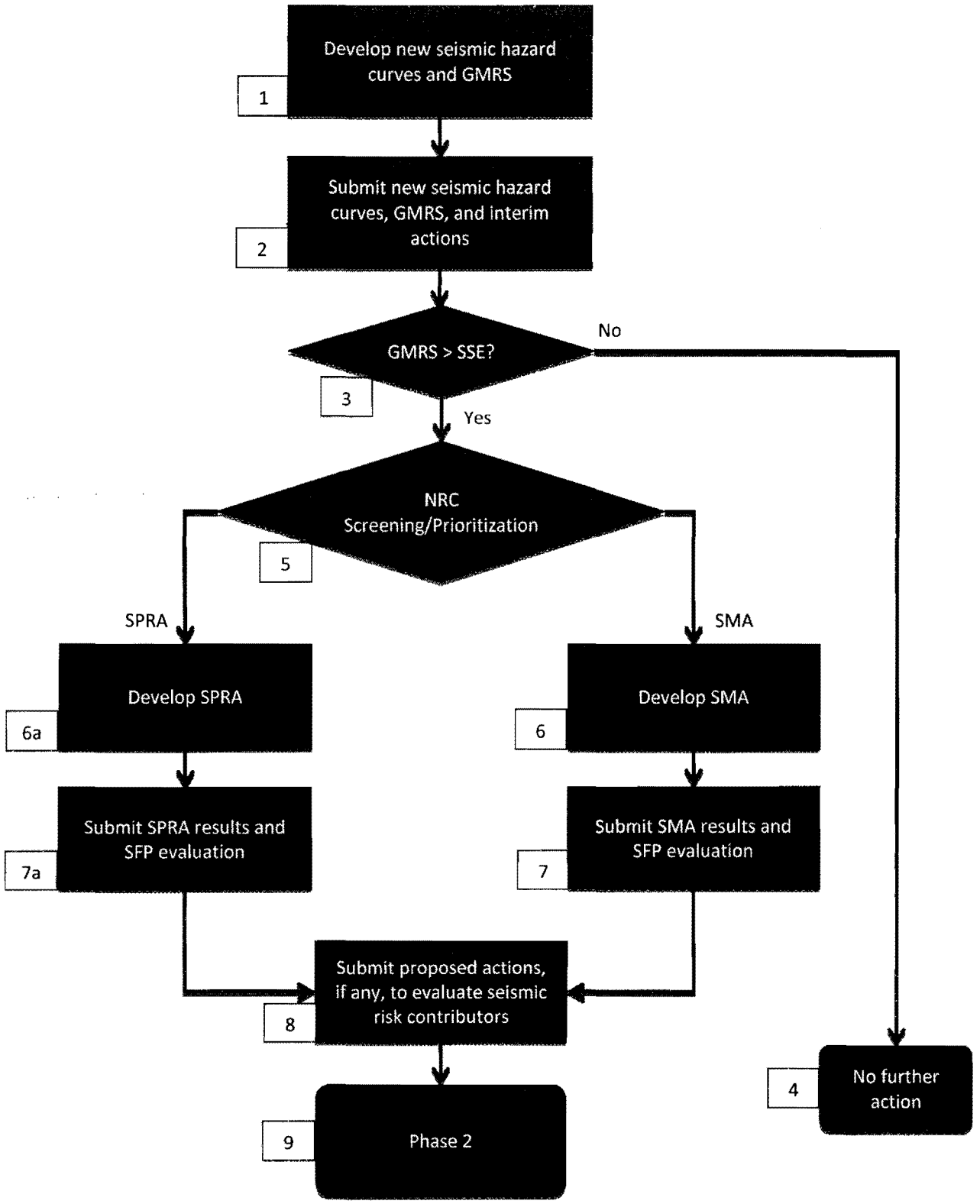


**Figure 1. Development of Requested Information and Its Use in Regulatory Analysis.**

**Enclosure 1 Reference List**

Atomic Energy Act of 1954, as amended, Section 103.b, 161.c, and 182.a

SECY 11-0137, "Prioritization of Recommended Actions to be Taken in Response to Fukushima Lessons Learned," Agencywide Documents Access and Management System (ADAMS) Accession No. ML11272A111, October 3, 2011.

SECY 11-0124, "Recommended Action to be taken without Delay from the Near-Term Task Force Report," ADAMS Accession No. ML11245A158, September 9, 2011.

10 CFR 50.54(f) – "Conditions of Licenses"

"Recommendations for Enhancing Reactor Safety in the 21st Century: The Near-term Task Force Review of Insights from the Fukushima Dai-ichi Accident," ADAMS Accession No. ML111861807, July 12, 2011.

"Generic Issue (GI)-199, 'Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants,'" ADAMS Accession No. ML051600272, June 9, 2005.

"NRC Generic Letter 1988-020, Supplement 4: Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities – 10 CFR 50.54(f)," ADAMS Accession No. ML031150485, June 28, 1991.

NUREG-1742, "Perspectives Gained from the Individual Plant Examination of External Events (IPEEE) Program – Final Report," ADAMS Accession Nos. ML021270070 and ML021270674, April 2002.

"Identification of a Generic Seismic Issue," ADAMS Accession No. ML051450456, May 26, 2005.

"Results of Initial Screening of Generic Issue 199, 'Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants.'" ADAMS Accession No. ML073400477, February 1, 2008.

"02/06/2008 Summary of Category 2 Public Meeting with the Public and Industry to Discuss Generic Issue 199, 'Implications of Updated Seismic Hazard Estimates in Central and Eastern United States on Existing Plants,'" ADAMS Accession No. ML080350189, February 8, 2008.

"Results of Safety/Risk Assessment of Generic Issue 199, 'Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants,'" ADAMS Accession No. ML100270582, September 2, 2010.

"10/6/201 – Public Meeting Summary on "Safety/Risk Assessment Results for Generic Issue 199, 'Implication of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants,'" ADAMS Accession Nc. ML102950263, October 29, 2010.

"NRC Information Notice 2010-018: Generic Issue 199, 'Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants,'" ADAMS Accession No. ML101970221, September 2, 2010.

Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, GDC 2, "Design Bases for Protection against Natural Phenomena"

10 CFR 50.34(a)(1), (a)(3), (a)(4), (b)(1), (b)(2), and (b)(4), "Contents of Applications; technical information."

Appendix A, "Seismic and Geologic Siting Criteria for Nuclear Power Plants," to 10 CFR Part 100, "Reactor Site Criteria"

"Use of Probabilistic Risk Assessment Methods in Nuclear Regulatory Activities" (Volume 60, page 42622, of the *Federal Register* (60 FR 42622)).

NUREG/BR-0058 Revision 4, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission," ADAMS Accession No. ML042820192, September 30, 2004.

"Draft NRC Generic Letter 2011-XX: Seismic Risk Evaluations for Operating Reactors," ADAMS Accession No. ML111710783, July 26, 2011.

NUREG/CR-4334, "An Approach to the Quantification of Seismic Margins in Nuclear Power Plants," ADAMS Accession No. ML090500182, August 1985.

Part 10 of the American Society of Mechanical Engineers/American Nuclear Society standard, RA-Sa-2009, "Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications,"

Regulatory Guide 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," Revision 2, ADAMS Accession No. ML090410014, March 2009.

Electric Power Research Institute (EPRI), "CEUS Ground Motion Project Final Report," EPRI Technical Report 1009684, December 2004.

Electric Power Research Institute (EPRI), "Program on Technology Innovation: Truncation of the Lognormal Distribution and Value of the Standard Deviation for Ground Motion Models in the Central and Eastern United States," Technical Report 1014381, Palo Alto, California, August 2006.

American Society of Mechanical Engineers/American Nuclear Society (ASME/ANS) RA-Sa-2009, "Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications," 2009.

NUREG/CR-6372, "Recommendations for Probabilistic Seismic Hazard Analysis: Guidance on Uncertainty and Use of Experts," ADAMS Accession Nos. ML080090003 and ML080090004, April 30, 1997.

NUREG-2117, "Practical Implementation Guidelines for SSHAC Level 3 and 4 Hazard Studies"

NUREG/CR-6728, "Technical Basis for Revision of Regulatory Guidance on Design Ground Motions: Hazard- and Risk-Consistent Ground Motion Spectra Guidelines," ADAMS Accession No. ML013100232, October 2001.

Regulatory Guide 1.208, "A Performance-Based Approach to Define the Site-Specific Earthquake Ground Motion," ADAMS Accession No. ML070310619, March 11, 2007.

NUREG-2115, "Central and Eastern United States Seismic Source Characterization for Nuclear Facilities"

RECOMMENDATION 2.1: FLOODING

## PURPOSE

The U.S. Nuclear Regulatory Commission (NRC or Commission) is issuing this information request for the following purposes:

- To gather information with respect to Near-Term Task Force (NTTF) Recommendation 2.1, as amended by staff requirements memoranda (SRM) associated with SECY-11-0124 and SECY-11-0137, and the Consolidated Appropriations Act, for 2012 (*Pub Law 112-74*), Section 402, to reevaluate seismic and flooding hazards at operating reactor sites

- To collect information to facilitate NRC's determination if there is a need to update the design basis and systems, structures, and components (SSCs) important to safety to protect against the updated hazards at operating reactor sites

- To collect information to address Generic Issue (GI) 204 regarding flooding of nuclear power plant sites following upstream dam failures

Pursuant to Sections 161.c, 103.b, and 182.a of the Atomic Energy Act of 1954, as amended, and Title 10 of the *Code of Federal* Regulations (10 CFR), Section 50.54(f), addressees are required to submit a written response to this information request.

## BACKGROUND

The SSCs important to safety in operating nuclear power plants are designed either in accordance with, or meet the intent of Appendix A to 10 CFR Part 50, General Design Criteria (GDC) 2. GDC 2 states that SSCs important to safety at nuclear power plants must be designed to withstand the effects of natural phenomena such as earthquakes, tornados, hurricanes, floods, tsunami, and seiches without loss of capability to perform their intended safety functions. The design bases for these SSCs reflect consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area. The design bases also reflect margin to account for the limited accuracy, quantity, and period of time in which the historical data have been accumulated.

In response to the accident at the Fukushima Dai-ichi nuclear power plant caused by the March 11, 2011, Tohoku earthquake and subsequent tsunami, the Commission established the NTTF to conduct a systematic review of NRC processes and regulations, and to make recommendations to the Commission for its policy direction. The NTTF developed a set of recommendations that are intended to clarify and strengthen the regulatory framework for protection against natural phenomena. The purpose of this letter is to gather information related to NTTF Recommendation 2.1 for flooding hazards. Recommendation 2.1, as amended by the SRMs associated with SECY-11-0124 and SECY-11-0137, instructs the NRC staff to issue requests for information to licensees pursuant to Sections 161.c, 103.b, and 182.a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f). This letter requests licensees and holders of construction permits under 10 CFR Part 50 to reevaluate the flooding hazards at their sites against present-day regulatory guidance and methodologies being used for early site permits and combined license reviews (SECY-11-0124, Staff Recommendations 2 and 4 for

NTTF Recommendation 2.1). This request is consistent with and required by the Consolidated Appropriations Act for 2012 (*Pub Law 112-74*), Section 402.

In developing Recommendation 2.1, the NTTF recognized that, "since the establishment of GDC 2, the NRC's requirements and guidance for protection from seismic events, floods, and other natural phenomena has continued to evolve," and that "as a result, significant differences may exist between plants in the way they protect against design-basis natural phenomena and the safety margin provided."

Since the issuance of GDC 2 in 1971, the NRC has developed new regulations, regulatory guidance, and several regulatory programs aimed at enhancements for previously licensed reactors. A summary of these regulatory programs for enhancements are described in Section 4.1.1 of the NTTF report. From this summary, items of note with regard to flooding include the individual plant examination of external events (IPEEE) program, the new requirement in 10 CFR 100.20 for applications after January 10, 1997, and efforts underway to update Regulatory Guide (RG) 1.59, "Design Basis Floods for Nuclear Power Plants."

Individual Plant Examination of External Events:

On June 28, 1991, the NRC issued Supplement 4 to Generic Letter (GL) 88-20, "Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities," (Agencywide Documents Access and Management System (ADAMS) Accession No. ML031150485) to request that each licensee identify and report to the NRC all plant-specific vulnerabilities to severe accidents caused by external events. The IPEEE program included the following four supporting objectives:

(1) Develop an appreciation of severe accident behavior.

(2) Understand the most likely severe accident sequences that could occur at the licensee's plant under full-power operating conditions.

(3) Gain a qualitative understanding of the overall likelihood of core damage and fission product releases.

(4) Reduce, if necessary, the overall likelihood of core damage and radioactive material releases by modifying, where appropriate, hardware and procedures that would help prevent or mitigate severe accidents.

The external events to be considered in the IPEEE were: seismic events; internal fires; high winds, floods, and other external initiating events, including accidents related to transportation or nearby facilities, and plant-unique hazards.

In most cases, licensees used a qualitative progressive-screening approach in lieu of a more quantitative approach to assess the flooding hazard. NUREG-1742, "Perspectives Gained from the Individual Plant Examination of External Events (IPEEE) Program," volumes 1 and 2 issued April, 2002 (ADAMS Accession Nos. ML021270070 and ML021270674) states that "given the substantial uncertainties involved in developing site-specific flood hazard curves, a consideration of possible combinations of multiple effects causing a range of flood levels would have enhanced the robustness of some of the licensee's analyses and lent greater confidence

to their findings." It should be noted that the term "vulnerability" was not defined in GL 88-20. Instead, GL 88-20 states that licensees should provide a discussion on how vulnerability is defined for each external event evaluated. NUREG-1742 notes that "as a result, the use of the term vulnerability varied widely among the IPEEE submittals...Some licensees avoided the term altogether, other stated that no vulnerabilities existed at their plant without defining the word, and still others provided a definition of vulnerability along with a discussion of their findings."

New Requirements for Evaluation of Dam Hazards in 10 CFR 100.20:

The staff established a new requirement in 10 CFR 100.20, "Factors to be Considered when Evaluating Sites," in 1996. The requirement in 10 CFR 100.20(b) states that for applications submitted on or after January 10, 1997, the nature and proximity of man-related hazards must be evaluated to establish site parameters for use in determining whether a plant design can accommodate commonly occurring hazards, and whether the risk of other hazards is very low. A parenthetical statement in the new regulation specifically identifies dams as hazards to be evaluated at a plant site.

Tsunami and Regulatory Guide 1.59 Updates:

Following the Sumatra earthquake and its accompanying tsunami in December 2004, the NRC staff initiated a study to examine tsunami hazards at power plant sites. Study results are documented in NUREG/CR-6966, "Tsunami Hazard Assessment at Nuclear Power Plant Sites in the United States of America," which was published in March 2009. As the NTTF report notes, "while tsunami hazards are not expected to be the limiting flood hazard for operating plants sited on the Atlantic Ocean and the Gulf of Mexico, plants in these coastal regions do not currently include an analysis of tsunami hazards in their licensing basis."

Regulatory Guide 1.59, "Design Basis Floods for Nuclear Power Plants," was originally issued in 1973. The most recent version is Revision 2, published in 1977, including an errata dated July 1980, and a substitution of methods presented in Appendix A (ADAMS Accession No. ML003740388). NRC staff is in the process of updating RG 1.59 to address advances in flooding analysis in the 35 years since Revision 2 was published. Although the update to RG 1.59 update is not complete, NUREG/CR7046, "Design Basis Flood Estimation for Site Characterization at Nuclear Power Plants in the United States of America," was published in November 2011. This report documents present-day methodologies used by the NRC to review early site permits (ESPs) and combined license (COL) applications.

GI-204: Flooding of Nuclear Power Plant Sites following Upstream Dam Failures:

Page 28 of the NTTF report states that, "In August 2010, the NRC initiated a proposed GI regarding flooding of nuclear power plant sites following upstream dam failures." The NRC staff approved this generic issue as GI-204 on February 29, 2012. The staff notes that the flood hazard information gathered by this 10 CFR 50.54(f) request will be applicable to the resolution of GI-204.

**APPLICABLE REGULATORY REQUIREMENTS**

- 10 CFR 50.34(a)(1), (a)(3), (a)(4), (b)(1), (b)(2), and (b)(4)
- 10 CFR 50.54, "Conditions of Licenses"
- Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, GDC 2, "Design Bases for Protection against Natural Phenomena"
- Appendix A, "Seismic and Geologic Siting Criteria for Nuclear Power Plants," to 10 CFR Part 100
- Subpart B, "Evaluation Factors for Stationary Power Reactors Site Applications On or After January 10, 1997," to 10 CFR Part 100

In GDC 2 it states that SSCs important to safety at nuclear power plants must be designed to withstand the effects of natural phenomena such as earthquakes, tornados, hurricanes, floods, tsunami, and seiches without loss of capability to perform their intended safety functions. The design bases for these SSCs are to reflect appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area. The design bases are also to reflect sufficient margin to account for the limited accuracy, quantity, and period of time in which the historical data have been accumulated.

Present-day regulations for reactor site criteria (Subpart B to 10 CFR Part 100 for applications on or after January 10, 1997) states, in part, that the physical characteristics of the site, including hydrology, must be evaluated and site parameters established such that potential threats from such physical characteristics will pose no undue risk to the type of facility proposed to be located at the site (10 CFR 100.21(d)). Factors to be considered when evaluating sites includes the nature and proximity of dams and other man-related hazards (10 CFR 100.20(b)) and the physical characteristics of the site, including the hydrology (10 CFR 100.20(c)).

**DISCUSSION**

The NTTF recommended that the Commission direct several actions to ensure adequate protection from natural phenomena, consistent with the current state of knowledge and analytical methods. These actions should be undertaken to prevent fuel damage and to ensure containment and spent fuel pool integrity. In particular, Recommendation 2.1 states, "Order licensees to reevaluate the seismic and flooding hazards at their sites against current NRC requirements and guidance, and if necessary, update the design basis and SSCs important to safety to protect against the updated hazards."

Staff assessment of Recommendation 2.1 is discussed in SECY-11-0124. Staff noted that the assumptions and factors that were considered in flood protection at operating plants vary. In some cases, the design bases did not consider the effects from local-intense precipitation and related site drainage. In other cases, the probable maximum flood is calculated differently at units co-located at the same site, depending on the time of licensing, resulting in different

design-basis flood protection. The NTTF and the staff noted that some plants rely on operator actions and temporary flood mitigation measures such as sandbagging, temporary flood walls and barriers, and portable equipment to perform safety functions. For several sites, the staff noted that not all appropriate flooding hazards are documented in the updated final safety analysis report. The NTTF and the staff also noted that flooding risks are of concern because of a "cliff-edge" effect, in that the safety consequences of a flooding event may increase sharply with a small increase in the flooding level. Therefore, the staff concluded that all licensees should confirm that SSCs important to safety are adequately protected from flooding hazards.

In the SRM to SECY-11-0124 the Commission approved the staff's proposed actions, which were to implement the NTTF recommendations as described in the SECY without delay. With regard to reevaluating flooding hazards, staff's approved actions are to:

1. Initiate stakeholder interactions to discuss application of present-day regulatory guidance and methodologies being used for ESP and COL reviews to the reevaluation of flooding hazards at operating reactors.

2. Develop and issue a request for information to licensees pursuant to 10 CFR 50.54(f) to:

   a. reevaluate site-specific flooding hazards using the methodology discussed in Item 1 above, and

   b. identify actions that have been taken or are planned to address plant-specific vulnerabilities associated with the updated flooding hazards.

The SRM to SECY-11-0124 also directed the NRC staff to do the following:

- For Recommendation 2.1, when the staff issues the requests for information to licensees pursuant to 10 CFR 50.54(f) to identify actions that have been taken or are planned to address plant-specific vulnerabilities associated with the reevaluation of seismic and flooding hazards, the staff should explain the meaning of "vulnerability."

- The staff should inform the Commission, either through an Information Paper or briefing of the Commissioners' Assistants, when it has developed the technical bases and acceptance criteria for implementing Recommendation 2.1, 2.3, and 9.3.

Additionally, the Consolidated Appropriations Act, for 2012 (*Pub Law 112-74*), Section 402, directs the NRC to "require reactor licensees to reevaluate the seismic, tsunami, flooding, and other external hazards at their sites against current applicable Commission requirements and guidance for such licensees as expeditiously as possible, and thereafter, when appropriate, as determined by the Commission, and require each licensee to respond to the Commission that the design basis for each reactor meets the requirements of its license, current applicable Commission requirements and guidance for such license." These other external hazards can include meteorological and other natural phenomena that could reduce or limit the capacity of safety-related cooling water supplies. These other external hazards will be addressed separately from this information request.

Following the Commission's direction to implement the staff's proposed actions without delay, the NRC staff will implement Recommendation 2.1 in two phases, as follows:

- Phase 1: Issue 10 CFR 50.54(f) letters to all licensees to reevaluate the seismic and flooding hazards at their sites against present-day regulatory guidance and methodologies used for ESP and COL reviews.

- Phase 2: If necessary, and based upon the results of Phase 1, determine whether additional regulatory actions are necessary (e.g., update the design basis and SSCs important to safety) to protect against the updated hazards

This information request addresses only Phase 1; Phase 2 will be conducted after receiving responses to this request.

The NRC staff will interact with industry and stakeholders to develop approaches that can be applied in a uniform and consistent manner across the different sites and plant conditions. This type of an integrated approach will allow the NRC and industry time to assess the significance of any new information related to the hazard evaluation in a systematic manner. This approach is also consistent with Commission direction to initiate stakeholder interactions. As such, responses to this request for information are expected in stages, as outlined in the Required Response section.

Because of the experience gained by both the NRC and the industry in preparing and reviewing numerous ESPs and COLs, present-day methodologies associated with evaluating flooding hazards at plant sites are well documented. It is anticipated that some interactions will be required with the industry and other stakeholders on particulars associated with implementing these methodologies for the existing plants (e.g., certain data collection activities are likely to be needed). However, the timeframe outlined in the requested response section takes this into account. General steps to develop the flooding hazard evaluation are discussed under the requested actions section below, and detailed steps are provided in Attachment 1.

Information related to the identification of actions that will be taken or planned to be taken to address plant-specific vulnerabilities will inform staff's development of "acceptance criteria" necessary to conduct Phase 2, or to address other regulatory actions as necessary. The approaches and methodology used to develop this information requires multiple interactions between the NRC staff, industry, and other stakeholders. The timeframe discussed in the requested response section explicitly recognizes this aspect.

**REQUESTED ACTIONS**

Addressees are requested to perform a reevaluation of all appropriate external flooding sources, including the effects from local intense precipitation on the site, probable maximum flood (PMF) on stream and rivers, storm surges, seiches, tsunami, and dam failures. It is requested that the reevaluation apply present-day regulatory guidance and methodologies being used for ESP and COL reviews including current techniques, software, and methods used in present-day standard engineering practice to develop the flood hazard. The requested information will be gathered in

Phase 1 of the NRC staff's two phase process to implement Recommendation 2.1, and will be used to identify potential vulnerabilities[1].

For the sites where the reevaluated flood exceeds the design basis, addressees are requested to submit an interim action plan that documents actions planned or taken to address the reevaluated hazard with the hazard evaluation.

Subsequently, addressees should perform an integrated assessment of the plant to identify vulnerabilities and actions to address them. The scope of the integrated assessment report will include full power operations and other plant configurations that could be susceptible due to the status of the flood protection features. The scope also includes those features of the ultimate heat sinks (UHS) that could be adversely affected by the flood conditions and lead to degradation of the flood protection (the loss of UHS from non-flood associated causes are not included). It is also requested that the integrated assessment address the entire duration of the flood conditions.

**REQUESTED INFORMATION**

The NRC staff requests that each addressee provide the following information. Attachment 1 provides additional information regarding present-day methodologies and guidance used by the NRC staff performing ESP and COL reviews. The attachment also provides a stepwise approach for assessing the flood hazard that should be applied to evaluate the potential hazard from flood causing mechanisms at each licensed reactor site.

1. **Hazard Reevaluation Report**

   Perform a flood hazard reevaluation. Provide a final report documenting results, as well as pertinent site information and detailed analysis. The final report should contain the following:

   a. Site information related to the flood hazard. Relevant SSCs important to safety and the UHS are included in the scope of this reevaluation, and pertinent data concerning these SSCs should be included. Other relevant site data includes the following:

      i. detailed site information (both designed and as-built), including present-day site layout, elevation of pertinent SSCs important to safety, site topography, as well as pertinent spatial and temporal data sets
      ii. current design basis flood elevations for all flood causing mechanisms
      iii. flood-related changes to the licensing basis and any flood protection changes (including mitigation) since license issuance
      iv. changes to the watershed and local area since license issuance

[1] A definition of vulnerability in the context of this enclosure is as follows: Plant-specific vulnerabilities are those features important to safety that when subject to an increased demand due to the newly calculated hazard evaluation have not been shown to be capable of performing their intended functions.

v. current licensing basis flood protection and pertinent flood mitigation features at the site
vi. additional site details, as necessary, to assess the flood hazard (i.e., bathymetry, walkdown results, etc.)

b. Evaluation of the flood hazard for each flood causing mechanism, based on present-day methodologies and regulatory guidance. Provide an analysis of each flood causing mechanism that may impact the site including local intense precipitation and site drainage, flooding in streams and rivers, dam breaches and failures, storm surge and seiche, tsunami, channel migration or diversion, and combined effects. Mechanisms that are not applicable at the site may be screened-out; however, a justification should be provided. Provide a basis for inputs and assumptions, methodologies and models used including input and output files, and other pertinent data.

c. Comparison of current and reevaluated flood causing mechanisms at the site. Provide an assessment of the current design basis flood elevation to the reevaluated flood elevation for each flood causing mechanism. Include how the findings from Enclosure 4 of this letter (i.e., Recommendation 2.3 flooding walkdowns) support this determination. If the current design basis flood bounds the reevaluated hazard for all flood causing mechanisms, include how this finding was determined.

d. Interim evaluation and actions taken or planned to address any higher flooding hazards relative to the design basis, prior to completion of the integrated assessment described below, if necessary.

e. Additional actions beyond Requested Information item 1.d taken or planned to address flooding hazards, if any.

**2. Integrated Assessment Report**

For the plants where the current design basis floods do not bound the reevaluated hazard for all flood causing mechanisms, provide the following:

a. Description of the integrated procedure used to evaluate integrity of the plant for the entire duration of flood conditions at the site.

b. Results of the plant evaluations describing the controlling flood mechanisms and its effects, and how the available or planned measures will provide effective protection and mitigation. Discuss whether there is margin beyond the postulated scenarios.

c. Description of any additional protection and/or mitigation features that were installed or are planned, including those installed during course of reevaluating

the hazard. The description should include the specific features and their functions.

d. identify other actions that have been taken or are planned to address plant-specific vulnerabilities.

**REQUIRED RESPONSE**

Within approximately 60 days of the date of this information request, NRC staff will determine the priority for each reactor site to complete the hazard reevaluation report. The site priority will determine the submittal date for addressees to provide written responses to Requested Information item 1 (Hazard Reevaluation Report).

In accordance with Sections 161.c, 103.b, and 182.a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f), an addressee must respond as described below.

1. Within 60 days of the date of the NRC's issuance of guidance on implementation details of the Integrated Assessment Report, including criteria for identifying vulnerabilities, submit an approach for developing an Integrated Assessment Report including criteria for identifying vulnerabilities[2].

2. In accordance with the NRC's prioritization plan, within 1- to 3-years from the date of this information request, submit the Hazard Reevaluation Report. Include the interim action plan requested in item 1.d, if appropriate.

3. Within 2 years following submittal of the Hazard Reevaluation Report to the NRC, any addressee who is requested to complete an Integrated Assessment should submit written responses to Requested Information item 2.

If an addressee cannot meet the requested response date, the addressee must provide a response within 90 days of the date of this information request and describe the alternative course of action that it proposes to take, including the basis of the acceptability of the proposed alternative course of action and estimated completion dates.

The prioritization described above will be based on information from COL and ESP applications, updated hazard levels if new information exists, and site-specific circumstances. This prioritization scheme is intended to use both the NRC and industry resources most effectively.

The required written response should be addressed to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, 11555 Rockville Pike, Rockville, MD 20852, under oath or affirmation under the provisions of Sections 161.c, 103.b, and 182.a of the Atomic

[2] The NRC staff will develop the implementation details of the Integrated Assessment Report, including criteria for identifying vulnerabilities This information is scheduled to be developed by November 30, 2012 and the NRC staff will interact with stakeholders, as appropriate during this process.

Energy Act of 1954, as amended, and 10 CFR 50.54(f). In addition, addressees should submit a copy of the response to the appropriate regional administrator.

**Attachment 1 to Recommendation 2.1: Flooding Enclosure 2**

## PROCEDURE

The steps shown in Figure 1 of this attachment represent an acceptable approach to perform the reevaluation of the flood hazard and integrated assessment. The flood hazard reevaluation should address all flood causing mechanisms that are pertinent to the site based on the geographic location and interface of the plant with the hydrosphere. The reason for omitting any of these flood causing mechanisms should be clearly discussed in the final report. A discussion of typical flood causing mechanisms is included below. Many types of flood causing mechanisms are included in that discussion, but it is important to note that each site should address unique characteristics and any additional flood causing mechanisms identified.

**Step 1**:
All licensees should review information concerning the current flooding hazard against that for which the plant is designed. This information will be used in the following steps for reevaluation of the flood hazard. Pertinent information includes, but is not limited to, the following:

- Current design basis flood hazard
- Flood elevations and other effects considered in the flood protection[3] for all flood causing mechanisms.
- Changes in licensing basis since initial licensing including site drainage characteristic and modification, watershed changes, new dam construction, revision of dam operations
- New information pertinent to the hydrologic characteristics including changes to dam operation, new flood studies and changes to meteorological basis (e.g., maximum precipitation studies)
- Pertinent information from site-related or watershed-related studies
- Site changes since issuance of the operating license (new barriers, openings, revised drainage systems, new structures, etc.)
- Flood protection mechanisms and identifying characteristics (e.g., structures and procedures)
- Pertinent features identified in site walkdowns

**Step 2**:
Reevaluate the flood hazard based on present day regulatory guidance and methodologies for each flood causing mechanism. Using any new site-related information and site details identified in Step 1, evaluate all possible flood causing mechanisms. Documentation of all methodologies should be discussed. This step of the process reiterates the current hierarchical hazard assessment (HHA) used by U.S. Nuclear Regulatory Commission (NRC) staff. The HHA is described as a progressively refined, stepwise estimation of the site-specific hazards that evaluates the safety of the site with the most conservative plausible assumptions consistent with available data.

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[3] Examples of other effects include dynamic wave effects, scouring, and debris transportation

(a) Select one flood causing mechanism to be reanalyzed
(b) Develop a conservative estimate of the site related parameters using simplifying assumptions for a flood causing mechanism and perform the reevaluation.
(c) Determine if the reevaluated flood hazard elevation (from Step 2b) is higher than the original design flood elevation for the selected flood causing mechanism. If not, use this flood elevation for this causal mechanism in Step 3.
(d) Determine if the site-related parameters can be further refined. If yes, perform reevaluation (repeat step 2c). If no, use this flood elevation for this causal mechanism in Step 3.
(e) Determine if all flood causing mechanisms have been addressed. If yes, continue to Step 3. If no, select another flood causing mechanism (Step 2a).

**Step 3:**
For each flood causing mechanism, compare the final flood elevations from the hazard reevaluation against the current design basis flood elevations. Using this comparison, determine whether the design basis flood bounds each reevaluated hazard from Step 2. If it is determined that the current design basis flood bounds all of the reevaluated hazards, proceed to Step 4. If not all of the reevaluated hazards are bounded by the current design basis flood, proceed to Step 6 for additional analysis.

**Step 4**:
Submit a report in accordance with Requested Information item 1, Hazard Reevaluation Report. It is anticipated that activities associated with the NTTF Recommendation 2.3 are completed and form a partial basis for the information requested.

**Step 5:**
No further action is required. This step demonstrates termination of the process for resolution of NTTF Recommendation 2.1.

**Step 6:** Submit a report in accordance with the Requested Information item 1, Hazard Reevaluation Report, including any relevant information from the results of plant walkdown activities related to NTTF Recommendation 2.3. Also, provide plans for conducting further analysis (steps 7 through 9) and submitting the final report identified in Requested Information item 2.

**Step 7**:
For the flood causing mechanisms that were not bounded, or for a controlling flood causing mechanism, perform an integrated assessment using the procedures developed in interactions with the NRC staff. The purpose of the integrated assessment is to determine the effectiveness of the existing design basis and any other planned or installed features for the protection and mitigation of flood conditions for the entire duration of the flood.

**Step 8:**
Identify vulnerabilities, if any, as a result of the assessment conducted in Step 7. Also, identify any planned actions or actions that were already taken to address these vulnerabilities.

**Step 9:**
Submit a report in accordance with the Requested Information item 2. Include a brief summary of the flood causing mechanisms and the associated parameters that were used in the assessment.

**Step 10**:
The information provided in Step 9 will be evaluated by the NRC in Phase 2 to consider any additional regulatory actions.

**FLOOD CAUSING MECHANISMS**

The NRC regulations require that structure, systems and components (SSCs) important to safety of a nuclear power plant are adequately protected from the adverse effects of flooding. The NRC staff discusses the approach for determining the flood hazard for new reactors in its current guidance documents, NUREG-0800 and NUREG/CR-7046.

As part of analyzing the flood hazard, it is important to list all plausible flood causing mechanisms that are capable of generating a severe flood at the site and to recognize that several scenarios of a particular flood causing mechanism can affect the site. For example, extreme precipitation can cause flooding in adjacent rivers, near-by tributaries, and on-site drainage facilities. Similarly, flood causing mechanisms that are not plausible at a particular site may also be ruled out. Present day NRC staff guidance applies the HHA (see NUREG/CR-7046) to each pertinent flood causing mechanism at a site.

The following is a list of flood causing mechanisms that should be addressed in a flood hazard analysis. Site specific characteristics may warrant review of other mechanisms in addition to those listed here.

1. Local Intense Precipitation

Local intense precipitation is a measure of the extreme precipitation at a given location. Generally, local intense precipitation values are developed using methods called Probable Maximum Precipitation (PMP) based on the methods developed by the federal government and published in hydrometeorological reports (HMR) by the National Weather Service. For extreme precipitation, localized precipitation values are developed using methods in HMR 52 (eastern areas of the United States (U.S.)) as well as regionalized reports within the HMR publication series.

The elevation of the site is not relevant for mitigation of flooding from local intense precipitation. The runoff carrying capacity of the site grading design and the performance of any active or passive drainage systems would determine the depth and velocity of surface runoff at the site. Typically, any active drainage system should be considered non-functional at the time of local intense precipitation event. Generally, runoff losses should be ignored during the local intense precipitation event to maximize the runoff. Hydraulic parameters that affect the depth and velocity of flow should be chosen carefully and should be consistent with values used in standard engineering practice.

2. Flooding in Streams and Rivers

The probable maximum flood (PMF) in rivers and streams adjoining the site should be determined by applying the PMP to the drainage basin in which the site is located. The PMF is based on a translation of PMP rainfall on a watershed to flood flow. The estimation of PMP for regional areas within the U.S. is based on HMRs and the appropriate regional report should be used to develop the PMP for a given site and watershed. The PMP is a deterministic estimate of the theoretical maximum depth of precipitation that can occur at a time of year of a specified area. A rainfall-to-runoff transformation function, as well as runoff characteristics, based on the topographic and drainage system network characteristics and watershed properties are needed to appropriately develop the PMF hydrograph. The PMF hydrograph is a time history of the discharge and serves as the input parameter for other hydraulic models which develop the flow characteristics including flood flow and elevation. The U.S. Army Corps of Engineers hydrologic and hydraulic methods are widely accepted in engineering practice. However, unique characteristics or preference of the analysis may dictate use of other models. Appropriate justification for selection of methods, data and models would depend on site-specific circumstances.

3. Dam Breaches and Failures

Flood waves resulting from the breach of upstream dams, including domino-type or cascading dam failures should be evaluated for the site. Water storage and water control structures (such as onsite cooling or auxiliary water reservoirs and onsite levees) that may be located at or above SSCs important to safety should also be evaluated. Additional effects for earthen embankments, such as sediment, should also be considered. Models and methods used to evaluate the dam failure and the resulting effects should be applicable to the type of failure mechanism and should be appropriately justified. Recent analyses completed by State and Federal agencies with appropriate jurisdiction for dams within the watershed may be used.

4. Storm Surge

Storm surge is the rise of offshore water elevation caused principally by the shear force of the hurricane or tropical depression winds acting on the water surface. Technical reports, from the National Oceanic and Atmospheric Administration (NOAA), provide guidance on developing wind fields for a probable maximum hurricane. The wind field parameter is input to coastal hydrodynamics simulation model that predict water surface rise based on the shear forces imparted by the wind. However, appropriate justification for selection of methods, data, and models depends on site-specific circumstances.

5. Seiche

A seiche is an oscillation of the water surface in an enclosed or semi-enclosed water body initiated by an external cause. If a seiche is determined to be possible at the site, then appropriate numerical modeling may be needed. For bays and lakes with irregular geometries and variable bathymetries, numerical longwave hydrodynamics modeling may be the only viable technique to determine hazard.

6. Tsunami

A tsunami is a series of water waves generated by a rapid, large scale disturbance of a water body due to seismic, landslide or volcanic tsunamingenic sources. An assessment with respect to tsunami can include a stepwise approach addressing: the susceptibility of the site's region subject to tsunami, the susceptibility of the plant site affected by tsunami, and specific hazards of the site posed to safety of the plant by tsunami.

7. Ice Induced Flooding

Ice jams and ice dams can cause flooding by impounding water upstream of a site and subsequently collapsing or downstream of a site impounding and backing up water. There is no method to assess a probable maximum ice jam or ice dam, therefore, historical records are generally accessed to determine the most severe historical event in the vicinity of the site. This method is based on an observed historical observation and reasonable margin should be considered.

8. Channel Migration or Diversion

Flood hazard associated with channel diversion is due to the possible migration either toward the site or away from it. For natural channels adjacent to the site, historical and geomorphic processes should be reviewed for possible tendency to meander. For man-made channels, canals or diversions used for the conveyance of water located at a site, possible failure of these structures should be considered.

9. Combined Effect Flood

For flood hazard associated with combined events, American Nuclear Society (ANS) 2.8-1992 provides guidance for combination of flood causing mechanisms for flood hazard at nuclear power reactor sites. In addition to those listed in the ANS guidance, additional plausible combined events should be considered on a site specific basis and should be based on the impacts of other flood causing mechanisms and the location of the site.

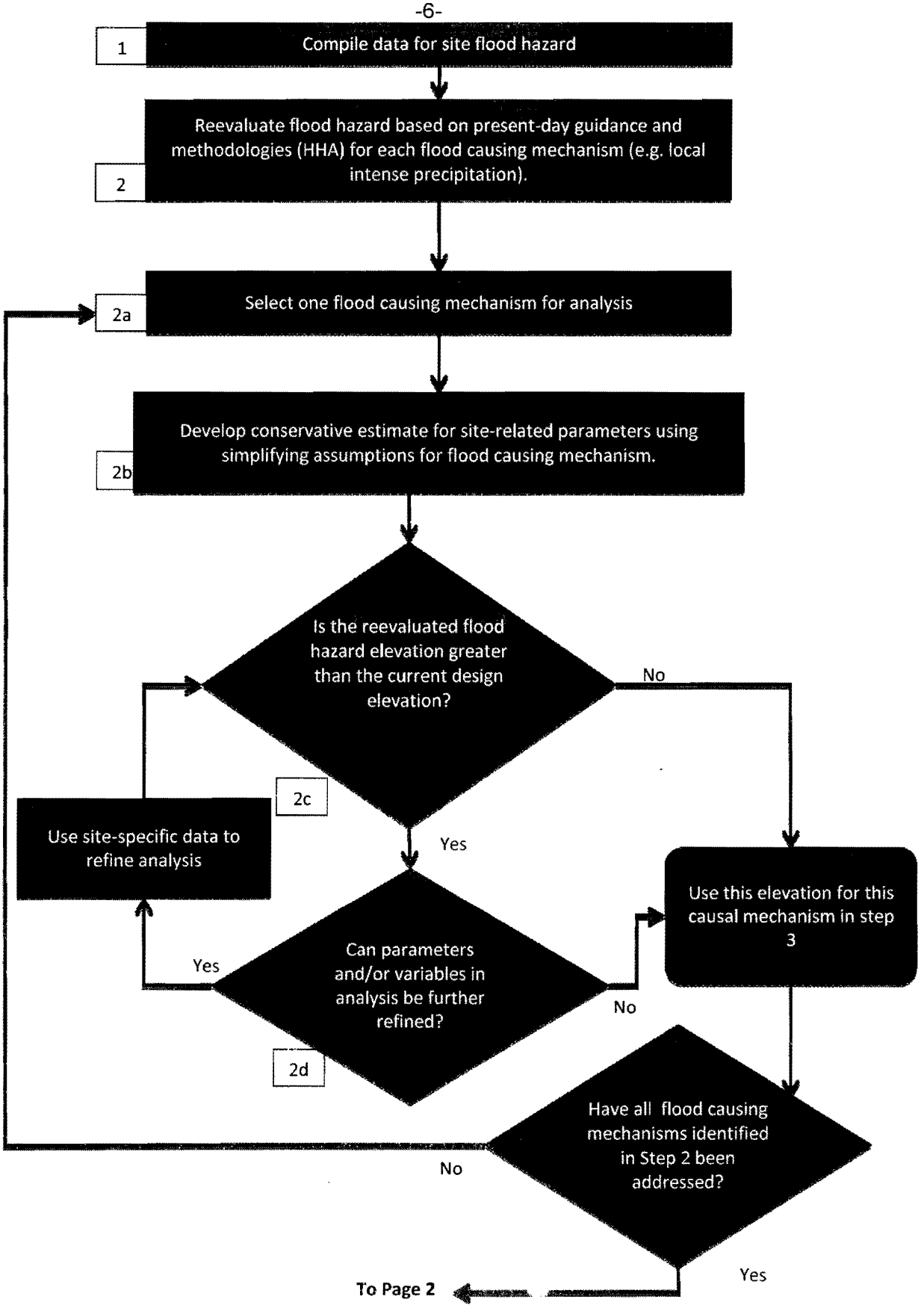


Figure 1. Development of Requested Information and Its Use in Regulatory Analysis. Page 1 of 2

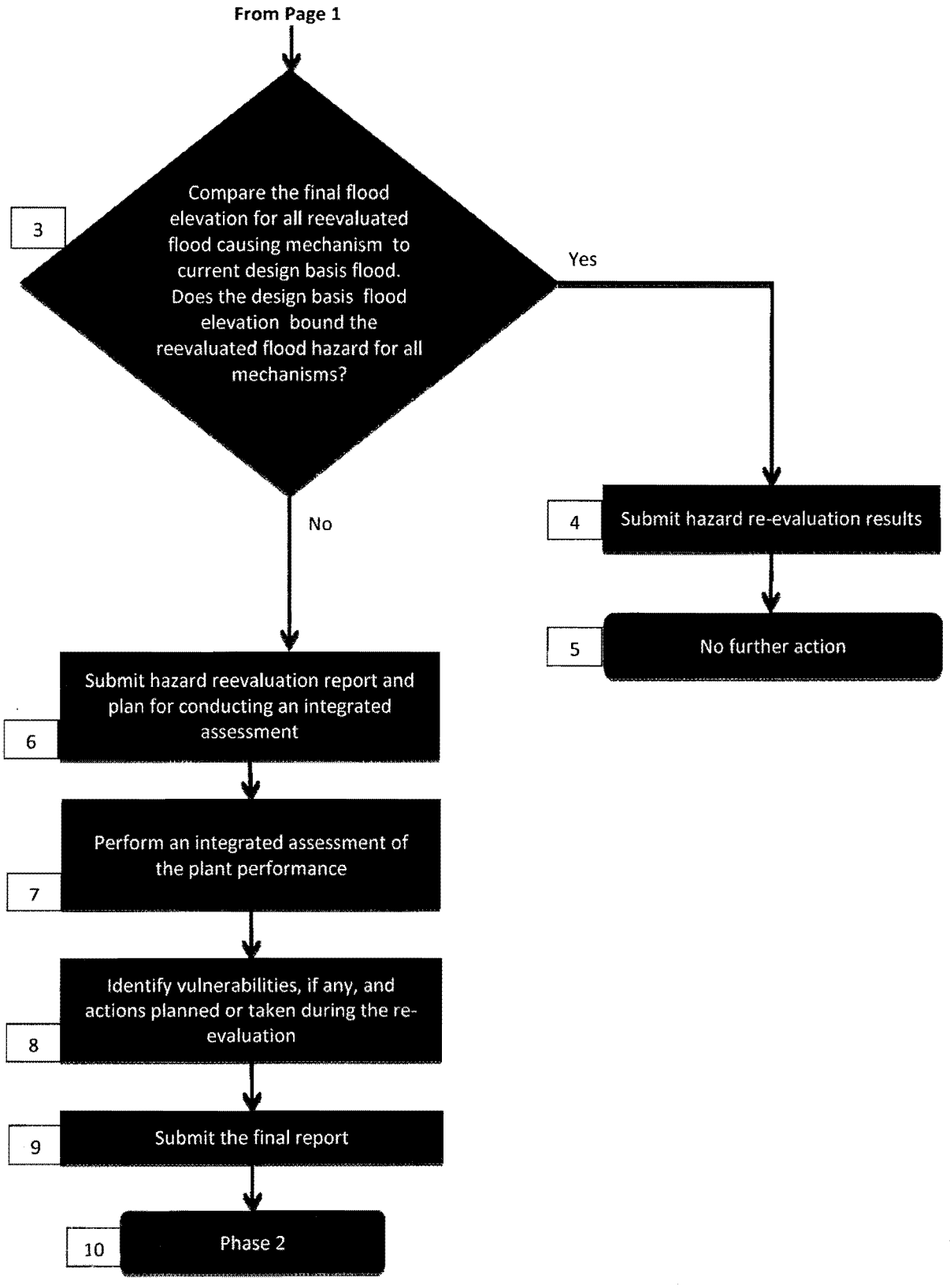


Figure 1. Development of Requested Information and Its Use in Regulatory Analysis. Page 2 of 2

**Enclosure 2 Reference List**

Sections 161.c, 103.b, and 182.a of the Atomic Energy Act of 1954, as amended

SECY 11-0124, "Recommended Actions To Be Taken Without Delay from the Near-Term Task Force Report," Agencywide Documents and Management System (ADAMS) Accession No. ML11245A158, September 9, 2011.

SECY 11-0137, "Prioritization of Recommended Actions to Be Taken in Response to Fukushima Lessons Learned," ADAMS Accession No. ML11272A111, October 3, 2011.

"Recommendations for Enhancing Reactor Safety in the 21st Century: The Near-term Task Force Review of Insights from the Fukushima Dai-ichi Accident," ADAMS Accession No. ML111861807, July 12, 2011.

10 CFR 50.54(f) – "Conditions of Licenses"

Appendix A to 10 CFR Part 100, Seismic and Geologic Siting Criteria for Nuclear Power Plants

Appendix A to 10 CFR Part 50, General Design Criteria 2

"Use of Probabilistic Risk Assessment Methods in Nuclear Regulatory Activities" (Volume 60, page 42622, of the *Federal Register* (60 FR 42622))

Supplement 4 to GL 88-20, "Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities," ADAMS Accession No. ML031150485, June 28, 1991.

10 CFR 100.20, "Factors to be Considered when Evaluating Sites,"

NUREG/BR-0058, Revision 4, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission," ADAMS Accession No. ML042820192, September 30, 2004.

SRM SECY 11-0124, "Recommended Actions To Be Taken Without Delay from the Near-Term Task Force Report," ADAMS Accession No. ML112911571, October 18, 2011.

SRM SECY 11-0137, "Prioritization of Recommended Actions to Be Taken in Response to Fukushima Lessons Learned," ADAMS Accession No. ML113490055, dated December 15, 2011.

10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities"

NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition – Site Characteristics and Site Parameters (Chapter 2)," ADAMS Accession No. ML070400364, March 2007.

NUREG/CR-7046, PNNL-20091, "Design-Basis Flood Estimation for Site Characterization at Nuclear Power Plants in the United States of America." ADAMS Accession No. ML11321A195, November 2011.

RG 1.29, "Seismic Design Classification," Revision 4, ADAMS Accession No. ML070310052, March 2007.

RG 1.59, "Design Basis Floods for Nuclear Power Plants," Revision 2, ADAMS Accession No. ML003740388, August 1977.

RG 1.102, "Flood Protection for Nuclear Power Plants," Revision 1, ADAMS Accession No. ML003740308, September 1976.

NOAA Hydrometeorological Report No. 52, "Application of Probable Maximum Precipitation Estimates – United States East of the 105th Meridian," U.S. Department of Commerce, National Oceanic and Atmospheric Administration, U.S. Department of the Army, Corps of Engineers, Washington, DC, August 1982.

NOAA Hydrometeorological Report No. 51, "Probable Maximum Precipitation Estimates - United States East of the 105th Meridian," U.S. Department of Commerce, National Oceanic and Atmospheric Administration, U.S. Department of the Army, Corps of Engineers, Washington, DC, 1978.

NOAA Hydrometeorological Report No. 53, "Seasonal Variation of 10-square mile Probable Maximum Precipitation Estimates – United States East of the 105th Meridian," U.S. Department of Commerce, National Oceanic and Atmospheric Administration, U.S. Department of the Army, Corps of Engineers, Washington, DC, 1980.

ANS 2.8-1992, "Determining Design Basis Flooding at Power Reactor Sites," 1992.

RECOMMENDATION 2.3: SEISMIC

## PURPOSE

The U.S. Nuclear Regulatory Commission (NRC or Commission) is issuing this information request for the following purposes:

- To gather information with respect to Near-Term Task Force (NTTF) Recommendation 2.3, as amended by staff requirements memorandum (SRM) associated with SECY-11-0124 and SECY-11-0137,
- To request licensees to develop a methodology and acceptance criteria for seismic walkdowns to be endorsed by the NRC staff,
- To request licensees to perform seismic walkdowns using the NRC-endorsed walkdown methodology, as defined herein,
- To identify and address degraded, nonconforming, or unanalyzed conditions through the corrective action program, and
- To verify the adequacy of licensee monitoring and maintenance procedures.

Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.54(f), addressees are required to submit a written response to this information request.

## BACKGROUND

Structures, systems, and components (SSCs) important to safety in operating nuclear power plants are designed either in accordance with, or meet the intent of, Appendix A to 10 CFR Part 100 and Appendix A to 10 CFR Part 50, General Design Criteria (GDC) 2. GDC 2 states that SSCs important to safety at nuclear power plants must be designed to withstand the effects of natural phenomena such as earthquakes, tornados, hurricanes, floods, tsunami, and seiches without loss of capability to perform their intended safety functions. The design bases for these SSCs are to reflect appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area. The design bases are also to reflect sufficient margin to account for the limited accuracy, quantity, and period of time in which the historical data have been accumulated.

In response to the accident at the Fukushima Dai-ichi nuclear power plant caused by the March 11, 2011, Tohoku earthquake and subsequent tsunami, the Commission established the NTTF to conduct a systematic review of NRC processes and regulations and to make recommendations to the Commission for its policy direction. The NTTF developed a set of recommendations that are intended to clarify and strengthen the regulatory framework for protection against natural phenomena. The purpose of this letter is to gather information with respect to NTTF Recommendation 2.3 for seismic hazards. Recommendation 2.3, and the SRMs associated with SECY-11-0124 and SECY-11-0137, instructs the NRC staff to issue requests for information to licensees pursuant to 10 CFR 50.54(f). This information request is for licensees to develop a methodology and acceptance criteria for seismic walkdowns to be endorsed by the staff following interaction with external stakeholders. It is requested that licensees perform the seismic walkdowns to identify and address plant-specific vulnerabilities (through its corrective action program) and verify the adequacies of monitoring and maintenance procedures.

In developing Recommendation 2.3, the NTTF recognized the need to verify the adequacy of features that play an integral role in the defense-in-depth approach for protection from natural phenomena. NTTF Recommendation 2.3 and SECY-11-0124 and SECY-11-0137 states that recent plant inspections have been conducted by NRC staff and industry in response to the Fukushima Dai-ichi accident and that these activities should be used to inform the implementation of this recommendation. Ongoing inspections of the Fukushima Dai-ichi and Dai-ni nuclear power stations may also provide insights useful for this recommendation. Furthermore, recent lessons learned from the earthquake near the North Anna Power Station should also be used to inform the development of the walkdown procedure(s).

## APPLICABLE REGULATORY REQUIREMENTS

- Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, GDC 2, "Design Bases for Protection against Natural Phenomena"
- 10 CFR 50.54, "Conditions of Licenses"
- 10 CFR 50.34(a)(1), (a)(3), (a)(4), (b)(1), (b)(2), and (b)(4)
- Appendix A, "Seismic and Geologic Siting Criteria for Nuclear Power Plants," to 10 CFR Part 100, "Reactor Site Criteria"

The seismic design bases for currently operating nuclear power plants were either developed in accordance with, or meet the intent of, GDC 2 and 10 CFR Part 100, Appendix A. Appendix A requires that safety-related SSCs remain functional if the safe shutdown earthquake (SSE) occurs.

## DISCUSSION

The NTTF recommended that the Commission direct several actions to ensure adequate protection from natural phenomena. The actions should be taken to prevent fuel damage, ensure containment integrity and the functionality of SSCs that support the spent fuel pool (SFP). In particular, NTTF Recommendation 2.3 states that the Commission should "Order licensees to perform seismic and flood protection walkdowns to identify and address plant-specific vulnerabilities and verify the adequacy of monitoring and maintenance for protection features such as water tight barriers and seals in the interim period until longer term actions are completed to update the design basis for external events." However, in the context of this letter, the NRC staff is focusing on degraded, nonconforming, or unanalyzed conditions.

The NRC staff's assessment of NTTF Recommendation 2.3 is discussed in SECY-11-0124. The NRC staff agreed with the NTTF Recommendation 2.3 findings and noted that various walkdown guidance exists and that recent plant inspections by staff in accordance with Temporary Instruction (TI) 2515/183, "Follow-up to the Fukushima Dai-ichi Nuclear Station Fuel Damage Event," and licensees' plant inspections in response to the Fukushima Dai-ichi accidents should help inform the implementation of this recommendation. Results of the NRC staff's evaluation of the recent earthquake near North Anna Power Station may also provide insights.

In its SRM to SECY-0124, the Commission approved the staff's proposed actions to implement without delay the NTTF recommendations as described in the SECY paper. With regard to Recommendation 2.3, the NRC staff-approved actions are to develop and issue a request for information to licensees pursuant to 10 CFR 50.54(f) to develop a methodology and acceptance criteria for seismic walkdowns to be endorsed by the NRC staff following interactions with external stakeholders, perform seismic walkdowns to identify and address plant-specific degraded, nonconforming, or unanalyzed conditions (through the corrective action program) and verify the adequacy of monitoring and maintenance for protective features, and inform the NRC staff of the results of the walkdowns and corrective actions taken or planned.

The TI 2515/183 was issued by the NRC on March 23, 2011. Inspection activities were completed by April 29, 2011, and NRC inspection reports were issued by May 13, 2011. The NRC developed a Summary of Observations report to encapsulate the performance of TI 2515/183 (see http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/follow-up-rpts.html). The summary report states that while individually, none of the observations posed a significant safety issue, they indicate a potential industry trend of failure to maintain equipment and strategies required to mitigate some design basis events. Regarding the licensees' capability to mitigate large fires or flooding coincident with seismic activity, the report notes that some equipment used to mitigate fires or station blackout was stored in areas that were not seismically qualified or that could be flooded.

As outlined in the SECY-11-0124, the NRC staff intends to work with the industry and other stakeholders to endorse a procedure(s) to develop acceptance criteria, conduct walkdowns, and identify degraded, nonconforming, or unanalyzed conditions. It is anticipated that the walkdown procedure will be developed by modifying various existing NRC and industry processes, including the recent inspections described above in accordance with TI 2515/183. Other guidance for seismic protection walkdowns include Electric Power Research Institute (EPRI) report NP-6041-SL, Revision 1, "A Methodology for Assessment of Nuclear Power Plant Seismic Margin," Seismic Qualification Utility Group procedure, "Generic Implementation Procedure (GIP) for Seismic Verification of Nuclear Power Plant Equipment," and International Atomic Energy Agency NS-G-2.13, "Evaluation of Seismic Safety for Existing Nuclear Installations." Additional details of attributes of a walkdown procedure are described in the Requested Action below.

The technical approach and methods used to develop the requested information should be integrated such that it accounts for design, physical barriers, procedures, temporary measures, and planned or installed mitigation measures to deal with external hazards. This type of an integrated approach will allow the NRC and industry to assess the significance of any new information related to the hazard in a systematic manner.

**REQUESTED ACTIONS**

In response to NTTF Recommendation 2.3, the Commission requests all licensees to perform seismic walkdowns in order to identify and address plant specific degraded, nonconforming, or unanalyzed conditions and verify the adequacy of strategies, monitoring, and maintenance programs such that the nuclear power plant can respond to external events. The walkdown will verify current plant configuration with the current licensing basis, verify the adequacy of current strategies, maintenance plans, and identify degraded, nonconforming, or unanalyzed conditions.

The walkdown procedure should be developed and submitted to the NRC. The procedure may incorporate current plant procedures, if appropriate. Prior to the walkdown, licensees should develop acceptance criteria, collect appropriate data, and assemble a team with relevant technical skills. Improvements made as part of the licensees' response to the individual plant examination of external events (IPEEE) program for seismic issues should be reported.

If any condition identified during the walkdown activities represents a degraded, nonconforming, or unanalyzed condition (i.e., noncompliance with the current licensing basis) for an SSC, describe actions that were taken or are planned to address the condition using the guidance in Regulatory Issues Summary 2005-20, Revision 1, Revision to NRC Inspection Manual Part 9900 Technical Guidance, "Operability Conditions Adverse to Quality or Safety," including entering the condition in the corrective action program. Reporting requirements pursuant to 10 CFR 50.72 should also be considered. Additionally, these findings should be considered in the Recommendation 2.1 hazard evaluations, as appropriate.

**REQUESTED INFORMATION**

1. The NRC requests that each addressee confirm that they will use the industry-developed, NRC-endorsed, seismic walkdown procedures[1] or provide a description of plant-specific walkdown procedures that include the following characteristics:

    a. Determination of the seismic walkdown scope and any combined effects
    b. Consideration of NUREG-1742, EPRI Report NP-6041, GIP, and common issues and findings discussed in the responses to TI 2515/183
    c. Pre-walkdown actions (e.g., data collection, review of drawings and procedures, identification of the plant licensing basis, identification of current seismic protection levels)
    d. Identification of SSCs requiring seismic protection and used in the protection of the reactor and spent fuel pool, including the ultimate heat sink (UHS)
    e. Description of the walkdown team composition and qualifications
    f. Details of the information to be collected during the walkdown including equipment access considerations
    g. Documentation and peer review requirements

2. Following the NRC's endorsement of the walkdown procedure, addresses are requested to conduct the walkdown and submit the final report which includes the following:

    a. Information on the plant-specific hazard licensing bases and a description of the protection and mitigation features considered in the licensing basis evaluation
    b. Information related to the implementation of the walkdown process
    c. A list of plant-specific vulnerabilities (including any seismic anomalies, outliers, or other findings) identified by the IPEEE and a description of the actions taken to eliminate or reduce them (including their completion dates)
    d. Results of the walkdown including key findings and identified degraded, nonconforming, or unanalyzed conditions. Include a detailed description of the

[1] NRC staff are currently engaged with industry and other external stakeholders to develop NRC-endorsed procedures. The NRC staff anticipates completing this activity by May, 2012.

actions taken or planned to address these conditions using the guidance in Regulatory Issues Summary 2005-20, Revision, 1, Revision to NRC Inspection Manual Part 9900 Technical Guidance, "Operability Conditions Adverse to Quality or Safety," including entering the condition in the corrective action program

e. Any planned or newly installed protection and mitigation features
f. Results and any subsequent actions taken in response to the peer review

**REQUIRED RESPONSE**

In accordance with 10 CFR 50.54(f), an addressee must respond as described below. The submission of the requested information is in stages to allow adequate time for further interactions with the stakeholders to provide clarifications, to develop implementation procedures and processes, and to develop the associated guidance as needed.

1. Within 120 days of the date of this information request, the addressee will confirm that they intend to use the NRC-endorsed seismic walkdown procedures, or provide to the NRC a description of the process that will be used to conduct the walkdowns and to develop the needed information.

2. Within 180 days of the NRC's endorsement of the walkdown process, each addressee will submit its final response. This response should include a list of any areas that are unable to be inspected due to inaccessibility and a schedule for when the walkdown will be completed.

If an addressee cannot meet the requested response date, the addressee must provide a response within 90 days of the date of this information request and describe the alternative course of action that it proposes to take, including the basis of the acceptability of the proposed alternative course of action and estimated completion dates.

The required written response should be addressed to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, 11555 Rockville Pike, Rockville, MD 20852, under oath or affirmation under the provisions of Sections 161.c, 103.b, and 182.a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f). In addition, addressees should submit a copy of the response to the appropriate regional administrator.

**Enclosure 3 Reference List**

SECY 11-0124, "Recommended Actions to be taken without Delay from the Near-Term Task Force Report," Agencywide Documents Access and Management System (ADAMS) Accession No. ML11245A158, September 9, 2011.

SECY 11-0137, "Prioritization of Recommended Actions to be Taken in Response to Fukushima Lessons Learned," ADAMS Accession No. ML11272A111, October 3, 2011.

SRM SECY 11-0124, "Recommended Action to be taken without Delay from the Near-Term Task Force Report," ADAMS Accession No. ML112911571, dated October 18, 2011.

SRM SECY 11-0137, "Prioritization of Recommended Actions to Be Taken in Response to Fukushima Lessons Learned," ADAMS Accession No. ML113490055, dated December 15, 2011.

10 CFR 50.54 – "Conditions of Licenses"

Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, GDC 2, "Design Bases for Protection against Natural Phenomena"

10 CFR 50.34(a)(1), (a)(3), (a)(4), (b)(1), (b)(2), and (b)(4)

10 CFR 50.72, "Immediate Notification Requirements for Operating Nuclear Power Reactors"

Appendix A, "Seismic and Geologic Siting Criteria for Nuclear Power Plants," to 10 CFR Part 100, "Reactor Site Criteria"

Temporary Instruction 2515/183, "Follow-up to the Fukushima Dai-ichi Nuclear Station Fuel Damage Event"

Summary of Observations report to encapsulate the performance of TI 2515/183 (http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/follow-up-rpts.html).

Electric Power Research Institute (EPRI) report NP-6041-SL Revision 1, "A Methodology for Assessment of Nuclear Power Plant Seismic Margin," August 1991.

Seismic Qualification Utility Group (SQUG) procedure: "Generic Implementation Procedure (GIP) for Seismic Verification of Nuclear Power Plant Equipment,"

International Atomic Energy Agency (IAEA) NS-G-2.13, "Evaluation of Seismic Safety for Existing Nuclear Installations."

RECOMMENDATION 2.3: FLOODING

## PURPOSE

The U.S. Nuclear Regulatory Commission (NRC or Commission) is issuing this information request for the following purposes:

- To gather information with respect to Near-Term Task Force (NTTF) Recommendation 2.3, as amended by staff requirements memorandum (SRM) associated with SECY-11-0124 and SECY-11-0137,
- To request licensees to develop a methodology and acceptance criteria for flooding walkdowns to be endorsed by the NRC staff,
- To request licensees to perform flooding walkdowns using an NRC-endorsed walkdown methodology, as defined herein
- To identify and address degraded, nonconforming, or unanalyzed conditions through the corrective action program
- To identify and address cliff-edge effects through the corrective action program
- To verify the adequacy of licensee monitoring and maintenance procedures.

Pursuant to Title 10 of the *Code of Federal* Regulations (10 CFR), Section 50.54(f), addressees are required to submit a written response to this information request.

## BACKGROUND

Structures, systems, and components (SSCs) important to safety in operating nuclear power plants are designed either in accordance with, or meet the intent of, Appendix A to 10 CFR Part 50, General Design Criteria (GDC) 2. GDC 2 states that SSCs important to safety at nuclear power plants must be designed to withstand the effects of natural phenomena such as earthquakes, tornados, hurricanes, floods, tsunami, and seiches without loss of capability to perform their intended safety functions. The design bases for these SSCs are to reflect appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area. The design bases are also to reflect sufficient margin to account for the limited accuracy, quantity, and period of time in which the historical data have been accumulated.

In response to the accident at the Fukushima Dai-ichi nuclear power plant caused by the March 11, 2011, Tohoku earthquake and subsequent tsunami, the Commission established the NTTF to conduct a systematic review of NRC processes and regulations, and to make recommendations to the Commission for its policy direction. The NTTF developed a set of recommendations that are intended to clarify and strengthen the regulatory framework for protection against natural phenomena. The purpose of this letter is to gather information related to NTTF Recommendation 2.3 for flooding hazards. Recommendations 2.3, and the SRMs associated with SECY-11-0124 and SECY-11-0137, instructs the NRC staff to issue requests for information to licensees pursuant to 10 CFR 50.54(f). This information request is for licensees to develop a methodology and acceptance criteria for flooding walkdowns to be endorsed by the NRC staff following interaction with external stakeholders. Licensees are requested to perform flood protection walkdowns to identify and address plant-specific

degraded, nonconforming, or unanalyzed conditions and cliff-edge effects (through the corrective action program) and verify the adequacy of monitoring and maintenance procedures.

In developing Recommendation 2.3, the NTTF observed that, "some plants have an overreliance on operator actions and temporary flood mitigation measures such as sandbagging, temporary flood walls and barriers, and portable equipment to perform safety functions." The NTTF report also states that, "the Task Force has concluded that flooding risks are of concern due to a 'cliff-edge' effect, in that the safely consequences of a flooding event may increase sharply with a small increase in the flooding level. Therefore, it would be very beneficial to safety for all licensees to confirm that SSCs important to safely are adequately protected from floods."

The NRC, in the past, has developed regulatory programs aimed at identifying plant-specific vulnerabilities to external flooding hazards. In June of 1991, the NRC issued Supplement 4 to Generic Letter (GL) 88-20, "Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities, 10 CFR 50.54(f)." This GL requested that "each licensee perform an individual plant examination of external events to identify vulnerabilities, if any, to severe accidents and report the results together with any licensee determined improvements and corrective actions to the Commission." Flood-related hazards were considered in the IPEEE program as one of the high winds, floods, and other (HFO) external initiating-event hazards. Of the 70 IPEEE submittals, most indicated some type of walkdown was performed for the HFO events. However, NUREG-1742 states, "the [HFO walkdown] submittals usually did not provide detailed descriptions of the walkdown procedures and results." NUREG-1742 also states that, "A few licensees proposed flood-related countermeasures that may be optimistic. For example, one licensee took credit for sandbagging up to a level of 9 feet. In several other submittals, flood barriers made of various construction materials, such as logs or concrete berms, were credited with being effective for preventing flooding, but the submittals did not discuss whether the licensees performed confirmatory testing to verify the effectiveness of certain of these mitigating actions."

In late December 1999, a severe storm induced flooding at Le Blayais nuclear power plant site in France. Lessons learned from this flooding event are documented in World Association of Nuclear Operators Significant Event Report (SER) 2000-3, "Severe Storm Results in Scram of Three Units and Loss of Safety System Functions due to Partial Plant Flooding," and in Institute of Nuclear Power Operations (INPO) SER 1-01, with the same title. Both reports list significant aspects and important lessons learned from the flooding event. On March 11, 2010, Électricité de France presented lessons learned from the 1999 Blayais flood at the NRC's Regulatory Information Conference (http://www.nrc.gov/public-involve/conference-symposia/ric/past/2010/slides/th35defraguierepv.pdf). Lessons learned discussed in this presentation were: (1) cable openings and trenches were an unrecognized common-mode vulnerability requiring review of existing protective measures, (2) difficulty in detecting water in affected rooms and an inadequate warning system, and (3) the flood's effects on support functions and surrounding areas were not adequately accounted or were inappropriate for the weather conditions.

## APPLICABLE REGULATORY REQUIREMENTS

- 10 CFR 50.34(a)(1), (a)(3), (a)(4), (b)(1), (b)(2), and (b)(4)
- 10 CFR 50.54, "Conditions of Licenses"
- Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, GDC 2, "Design Bases for Protection against Natural Phenomena"
- Appendix A, "Seismic and Geologic Siting Criteria for Nuclear Power Plants," to 10 CFR Part 100

The flooding design bases for currently operating nuclear power plants were either developed in accordance with, or meet the intent of, GDC 2 and 10 CFR Part 100, Appendix A (seismically induced floods and water waves). GDC 2 states that SSCs important to safety at nuclear power plants must be designed to withstand the effects of natural phenomena such as earthquakes, tornados, hurricanes, floods, tsunami, and seiches without loss of capability to perform their intended safety functions. The design bases for these SSCs are to reflect appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area. The design bases are also to reflect sufficient margin to account for the limited accuracy, quantity, and period of time in which the historical data have been accumulated.

## DISCUSSION

The NTTF recommended that the Commission direct several actions to ensure adequate protection from natural phenomena. These actions should be taken to prevent fuel damage and to ensure containment and spent fuel pool integrity. In particular, Recommendation 2.3 states that the Commission should "Order licensees to perform seismic and flood protection walkdowns to identify and address plant-specific vulnerabilities and verify the adequacy of monitoring and maintenance for protection features such as water tight barriers and seals in the interim period until longer term actions are completed to update the design basis for external events." However, in the context of this letter, the NRC staff is focusing on degraded, nonconforming, or unanalyzed conditions and cliff-edge effects.

The NRC staff's assessment of NTTF Recommendation 2.3 is discussed in SECY-11-0124. The NRC staff agreed with the NTTF Recommendation 2.3 findings and noted that some plants rely on operator actions and temporary flood mitigation measures such as sandbagging, temporary flood walls and barriers, and portable equipment to perform safety functions. Results of staff's inspections at nuclear power sites in accordance with Temporary Instruction (TI) 2515/183 identified potential issues and observations regarding mitigation measures. Recent flooding at the Fort Calhoun site showed the importance of temporary flood mitigation measures. The NRC staff also noted that guidance should be developed for flooding walkdowns with external stakeholder involvement to ensure consistency.

In its SRM to SECY-11-0124, the Commission approved the NRC staff's proposed actions to implement without delay the NTTF recommendations as described in the SECY. With regards to Recommendation 2.3, NRC staff's approved actions are to develop and issue a request for information to licensees pursuant to 10 CFR 50.54(f) to develop a methodology and acceptance criteria for flooding walkdowns to be endorsed by the NRC staff following interaction with external stakeholders, perform flood protection walkdowns to identify and address plant-specific degraded, nonconforming, or unanalyzed conditions and cliff-edge effects (through the corrective action program) and verify the adequacy of monitoring and maintenance for protection features, and inform the NRC of the results of the walkdowns and corrective actions taken or planned.

The TI 2515/183 was issued by the NRC on March 23, 2011. Inspection activities were completed by April 29, 2011, and NRC inspection reports were issued by May 13, 2011. The NRC developed a Summary of Observations report to document the performance of TI 2515/183 (see http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/follow-up-rpts.html). The summary report states that while individually, none of the observations posed a significant safety issue, they indicate a potential industry trend of failure to maintain equipment and strategies required to mitigate some design basis events. Regarding the licensee's capability to mitigate design bases flooding events, the report notes that some equipment (mainly pumps) would not operate when tested, or lacked test acceptance criteria, and that some discrepancies were identified with barrier and penetration seals.

Additional review of Section 03.03 of the responses to TI 2515/183 indicates that several sites were susceptible to water accumulation that submerged safety-related cables. Issues were noted with cracks in penetrations, evidence of water infiltration, and groundwater intrusion. Individual TI inspection reports noted that a few licensee-proposed flood-related countermeasures may not achieve the intended mitigative effect. Flood barriers made of various construction materials were credited with being effective for preventing flooding, but the confirmatory testing to verify the effectiveness of certain of these mitigating actions was not conclusive. It should be noted that these findings are consistent with findings documented in the "Perspectives Gained" section of the IPEEE program report (NUREG-1742).

The Advisory Committee on Reactor Safeguards (ACRS) in its letter dated October 13, 2011, requested that the Commission consider that "site-specific external hazards, vulnerabilities, and consequences need to be evaluated in an integrated context. For example, tornadoes and hurricanes may cause extended loss of offsite power with coincident physical damage to nonsafety structures or equipment at multiple units that has not been fully evaluated. Damage from severe storms or other site-specific hazards may also disable external essential cooling water supplies. Vulnerabilities to those hazards and subsequent damage may not be identified from assessments that focus only on design-basis seismic and flooding events." The ACRS further requested that "Near-term actions related to NTTF Recommendation 2.3 should be expanded to assure that the walkdowns address the integrated effects of severe storms as well as seismic and flooding events. The walkdowns and associated assessments should confirm that the identified hazards and vulnerabilities remain bounded by the current plant licensing basis."

The NRC staff will interact with industry and stakeholders to develop a methodology and acceptance criteria for flooding walkdowns. These walkdowns should integrate the External Flood results in NUREG-1742, common issues and findings discussed in Section 03.03 of the responses to TI 2515/183, and the Significant Aspect findings discussed INPO SER 1-01. It is anticipated that the walkdown procedure will be developed or modified using various existing NRC- and industry-developed procedures. As mentioned in SECY-11-0124, recent flood events such as those at Fort Calhoun should also provide valuable insights. Additional attributes of the walkdown procedure are described in the Requested Action section below. The technical approach used to develop the needed information should be holistic and integrated to account for the site-specific design, physical barriers, procedures, temporary measures, and planned or installed mitigation measures to deal with the potential flooding scenarios.

As stated earlier, the NRC staff will interact with industry and other stakeholders to develop an approach, which can be applied in a uniform and consistent manner across the different sites and plant conditions. An integrated approach will allow the NRC and industry to assess the significance of any new information related to flooding hazards in a systematic manner. During these interactions, the NRC staff will also work with industry and stakeholders to identify efficiencies and strategies to ensure that responses and reviews are timely and support the Commission guidance on the overall schedule.

As mentioned in the cover letter, other external events (e.g., extreme winds and its effects) will be covered as a separate action from this letter. It would be prudent for addressees to consider the inclusion of other external events in these walkdown procedures due to the potential efficient use of similar resources to perform these walkdowns.

**REQUESTED ACTIONS**

The NRC requests that each addressee confirm that they will use the industry-developed, NRC-endorsed, flood walkdown procedures[1] or provide a description of plant-specific walkdown procedures. The requested actions include the following:

(1) Perform flood protection walkdowns using an NRC-endorsed walkdown methodology,
(2) Identify and address plant-specific degraded, nonconforming, or unanalyzed conditions, as well as, cliff-edge effects through the corrective action program, and consider these findings in the Recommendation 2.1 hazard evaluations, as appropriate,
(3) Identify any other actions taken or planned to further enhance the site flood protection,
(4) Verify the adequacy of programs, monitoring and maintenance for protection features, and,
(5) Report to the NRC the results of the walkdowns and corrective actions taken or planned.

A final report should be submitted to the NRC addressing items identified in the Requested Information section.

[1] NRC staff are currently engaged with industry and other external stakeholders to develop NRC-endorsed procedures. The NRC staff anticipates completing this activity by May, 2012.

It is requested that the walkdown procedure verify that flood protection systems for the plant are available, functional, and implementable under a variety of site conditions. In particular, the walkdowns should confirm that: (1) cable and piping trenches and other penetrations to SSCs important to safety, including underground rooms, are not pathways for external ingress of water, (2) adequate water detection and warning systems are available, if credited in the current licensing basis, (3) the effects of elevated water levels and severe weather conditions would not impair support functions or would not impede performing necessary actions given the weather conditions, and (4) other factors at multi-unit sites (e.g., equipment availability and staffing) would not prevent implementation of flood protection measures.

If any condition identified during the walkdown activities represents a degraded, nonconforming, or unanalyzed condition (i.e., noncompliance with the current licensing basis) for an SSC, describe actions that were taken or are planned to address the condition using the guidance in Regulatory Issues Summary 2005-20, Revisions 1, Revision to NRC Inspection Manual Part 9900 Technical Guidance, "Operability Conditions Adverse to Quality or Safety," including entering the condition in the corrective action program. Reporting requirements pursuant to 10 CFR 50.72 should also be considered. In addition, if any condition noted during the walkdown represents a cliff-edge effect, describe any measures taken or planned to address the condition(s) while the corrective action is being implemented.

Along with an assessment of reactor integrity, the NTTF recommended an evaluation of spent fuel pools to assess the effectiveness of the flood protection. The approach should account for the site-specific design, physical barriers, procedures, temporary measures, and planned or existing mitigation measures.

**REQUESTED INFORMATION**

1. The NRC requests that each addressee confirm that it will use the industry-developed, NRC-endorsed, flooding walkdown procedures or provide a description of plant-specific walkdown procedures that include the following characteristics:

    a. Address the NTTF Report's observations regarding "overreliance on operator actions and temporary flood mitigation measures" and the 'cliff-edge' effect regarding a sharp increase in flooding risks with a small increase in flooding level.
    b. Integrate issues discussed in the External Flood Qualitative Results (Section 4.3.3) in NUREG-1742, common issues and findings discussed in Section 03.03 of the responses to TI 2515/183, and the Significant Aspect findings discussed in INPO SER 1-01.
    c. Integrate insights from any new and relevant flood hazard information, as well as recent flood-related walkdowns such as the events at the Fort Calhoun site, as mentioned in SECY-11-0124. Additionally, relevant NRC inspection findings could provide additional insights.
    d. Integrate the combined effects of flooding along with other adverse conditions, such as high winds, hail, lightning, etc., that could reasonably be expected to simultaneously occur. For example, steps in a flooding procedure that require manipulation of systems and components in outside areas of the plant site that could not be safely assessed because of storm conditions.

e. Identify pre-walkdown actions, such as the collection of current site topography including any changes since the original licensing (e.g., security improvements and temporary structures), sets of as-built drawings, review of the existing design basis flood level(s), review of any flood protection and pertinent flood mitigation features, such as exterior barriers, incorporated barriers, and temporary flood barriers.
f. Identify a list of pertinent elevations of Regulatory Guide 1.29[2] structures, systems, and components that should be designed to withstand the design basis hazard (similar to Table 1, i.e., 3.1.3 of American National Standards Institute/American Nuclear Society (ANSI/ANS)-2.8-1992)
g. Identify the team composition and qualifications.
h. Verify that flood protection systems are available, functional, and implementable under a variety of site conditions by reviewing the following:
    i. Operator availability, operator training, timeliness of response, equipment maintenance and operability, back-up availability, operator access under adverse site conditions[3]
    ii. Methods and acceptance criteria to evaluate exterior barriers[4]
    iii. Methods and acceptance criteria to evaluate incorporated barriers
    iv. Methods and acceptance criteria to evaluate temporary flood barriers
    v. Preparations in advance of adverse weather conditions
i. Identify programs in place that periodically verify the status and adequacy of flood mitigation strategies and equipment.
j. Develop a documentation template, including peer-review requirements, so that walkdown results can be efficiently and uniformly reviewed and evaluated. The template should also consider the reporting requirement discussed below.

2. Following NRC's endorsement of the walkdown procedure, conduct the walkdown and submit a final report which includes the following:

a. Describe the design basis flood hazard level(s) for all flood-causing mechanisms, including groundwater ingress.
b. Describe protection and mitigation features that are considered in the licensing basis evaluation to protect against external ingress of water into SSCs important to safety.
c. Describe any warning systems to detect the presence of water in rooms important to safety.
d. Discuss the effectiveness of flood protection systems and exterior, incorporated, and temporary flood barriers. Discuss how these systems and barriers were evaluated using the acceptance criteria developed as part of Requested Information item 1.h.

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[2] Regulatory Guide 1.59, "Design Basis Floods for Nuclear Power Plants", and Regulatory Guide 1.102, Flood Protection for Nuclear Power Plants," both recommend the use of Regulatory Guide 1.29, "Seismic Design Classification" for identifying structures, systems, and components, that should be designed to withstand the conditions resulting from the design basis flood and remain functional.

[3] This may not be an all-inclusive list.

[4] See Regulatory Position 1 of Regulatory Guide 1.102, "Flood Protection for Nuclear Power Plants," for definitions acceptable to the NRC staff for exterior barriers, incorporated barriers, and temporary barriers.

e. Present information related to the implementation of the walkdown process (e.g., details of selection of the walkdown team and procedures,) using the documentation template discussed in Requested Information item 1.j, including actions taken in response to the peer review.
f. Results of the walkdown including key findings and identified degraded, nonconforming, or unanalyzed conditions. Include a detailed description of the actions taken or planned to address these conditions using the guidance in Regulatory Issues Summary 2005-20, Revision 1, Revision to NRC Inspection Manual Part 9900 Technical Guidance, "Operability Conditions Adverse to Quality or Safety," including entering the condition in the corrective action program.
g. Document any cliff-edge effects identified and the associated basis. Indicate those that were entered into the corrective action program. Also include a detailed description of the actions taken or planned to address these effects.
h. Describe any other planned or newly installed flood protection systems or flood mitigation measures including flood barriers that further enhance the flood protection. Identify results and any subsequent actions taken in response to the peer review.

**REQUIRED RESPONSE**

In accordance with 10 CFR 50.54(f), an addressee must respond as described below. The submission of the requested information is in stages to allow adequate time for further interactions with the stakeholders to provide clarifications, to develop implementation procedures and processes, and to develop the associated guidance as needed.

1. Within 90 days of the date of this information request, the addressee will confirm that it intends to use the NRC-endorsed flooding walkdown procedures or provide the NRC a description of the process that will be used to conduct the walkdowns and to develop the needed information.

2. Within 180 days of NRC's endorsement of the walkdown procedure, each addressee will submit its final response for the requested information. This response should include a list of any areas that are unable to be inspected due to inaccessibility and a schedule for when the walkdown will be completed.

If an addressee cannot meet the requested response date, the addressee must provide a response within 90 days of the date of this information request and describe the alternative course of action that it proposes to take, including the basis of the acceptability of the proposed alternative course of action and estimated completion dates.

The required written response should be addressed to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, 11555 Rockville Pike, Rockville, MD 20852, under oath or affirmation under the provisions of Sections 161.c, 103.b, and 182.a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f). In addition, addressees should submit a copy of the response to the appropriate regional administrator.

**Enclosure 4 References**

SECY-11-0124, "Recommended Actions to be taken without Delay from the Near-Term Task Force Report," Agencywide Documents Access and Management System (ADAMS) Accession No. ML11245A158, dated September 9, 2011.

SECY-11-0137, "Prioritization of Recommended Actions to be Taken in Response to Fukushima Lessons-Learned," ADAMS Accession No. ML11272A111, October 3, 2011.

"Recommendations for Enhancing Reactor Safety in the 21st Century: The Near-term Task Force Review of Insights from the Fukushima Dai-ichi Accident," ADAMS Accession No. ML111861807, July 12, 2011.

10 CFR 50.54 – Conditions of Licenses

10 CFR 50.72, "Immediate Notification Requirements for Operating Nuclear Power Reactors"

Appendix A to 10 CFR Part 50, General Design Criteria for Nuclear Power Plants

Appendix A to 10 CFR Part 100, Seismic and Geologic Siting Criteria for Nuclear Power Plants

Temporary Instruction 2515/183, "Follow-up to the Fukushima Dai-ichi Fuel Damage Event," November 2011, ADAMS Accession No. ML113220407.

Energy and Water Development and Related Agencies Appropriations Act, 2012

NUREG-0800, SRP Section 2.4

NUREG-1407, "Procedural and Submittal Guidance for the Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities," Final Report, ADAMS Accession No. ML063550238, June 1991.

ASME/ANS RA-Sa-2009, American Society of Mechanical Engineers/American Nuclear Society standard, RA-Sa-2009, "Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications," 2009.

INPO version, SER 1–01, "WANO Significant Event Report (SER) 2000-3, 'Severe Storm Results in Scram of Three Units and Loss of Safety System Functions Due to Partial Plant Flooding,'" February 2001 (Proprietary)

## RECOMMENDATION 9.3: EMERGENCY PREPAREDNESS

### Communications

## PURPOSE

The U.S. Nuclear Regulatory Commission (NRC or Commission) is issuing this information request regarding the power supplies for communications systems to determine if additional regulatory action is warranted. This request is based upon Near-Term Task Force (NTTF) Recommendation 9.3 which proposed that facility emergency plans provide for a means to power communications equipment needed to communicate onsite (e.g., radios for response teams and between facilities) and offsite (e.g., cellular telephones and satellite telephones) during a prolonged station blackout.

## APPLICABLE REGULATORY REQUIREMENTS AND GUIDANCE

Emergency plan communications requirements and detailed guidance on how to meet those requirements are contained in the following:

1. Title 10 of the Code *of Federal Regulations* (10 CFR) 50.47 (b)(6) states that provisions should be made for prompt communications among principal response organizations to emergency personnel and to the public.

2. Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50, "Domestic Licensing for Production and Utilization Facilities," Section IV. E. 9, states that adequate provisions shall be made and described for emergency facilities and equipment, including "at least one onsite and one offsite communications system; each system shall have a backup power source."

3. NUREG-0696, "Functional Criteria for Emergency Response Facilities," issued February 1981, offers guidance on how to meet the requirements of Appendix E to 10 CFR Part 50, and discusses the onsite and offsite communications requirements for the licensee's emergency operating facilities.

## DISCUSSION

During the March 11, 2011, Tōhoku earthquake and subsequent tsunami, the widespread destruction and loss of electrical power degraded communications capabilities onsite at Fukushima Dai-ichi and between the site and external stakeholders, such as local emergency response centers, the Japanese government, and corporate offices. Normal and emergency offsite communications systems lost power or were degraded by the earthquake and tsunami. Normal and emergency onsite communications were severely impacted by the loss of power to signal repeaters and depleted radio batteries. Accounts of the accident response refer to delays in repair activities caused by issues with the ability to effectively communicate between repair teams and the control rooms and the onsite emergency response center.

The NRC requests that the following assumptions be made in preparing responses to this request for information: the potential onsite and offsite damage is a result of a large scale natural event resulting in a loss of all alternating current (ac) power.

In addition, assume that the large scale natural event causes extensive damage to normal and emergency communications systems both onsite and in the area surrounding the site. It has been recognized that following a large scale natural event that ac power may not be available to cell and other communications infrastructures.

**REQUESTED ACTIONS**

It is requested that addressees assess their current communications systems and equipment used during an emergency event given the aforementioned assumptions. It is also requested that consideration be given to any enhancements that may be appropriate for the emergency plan with respect to communications requirements of 10 CFR 50.47, Appendix E to 10 CFR Part 50, and the guidance in NUREG-0696 in light of the assumptions stated above. Also addressees are requested to consider the means necessary to power the new and existing communications equipment during a prolonged SBO.

**REQUESTED INFORMATION**

1. Addressees are requested to provide an assessment of the current communications systems and equipment used during an emergency event to identify any enhancements that may be needed to ensure communications are maintained during a large scale natural event meeting the conditions described above. The assessment should:

   - Identify any planned or potential improvements to existing onsite communications systems and their required normal and/or backup power supplies,

   - Identify any planned or potential improvements to existing offsite communications systems and their required normal and/or backup power supplies,

   - Provide a description of any new communications system(s) or technologies that will be deployed based upon the assumed conditions described above, and

   - Provide a description of how the new and/or improved systems and power supplies will be able to provide for communications during a loss of all ac power,

2. Addressees are requested to describe any interim actions that have been taken or are planned to be taken to enhance existing communications systems power supplies until the communications assessment and the resulting actions are complete,

3. Provide an implementation schedule of the time needed to conduct and implement the results of the communications assessment.

**REQUIRED RESPONSE**

The addressee should respond to this request for information no later than 90 days from the date of issuance.

If an addressee cannot meet the requested response date, the addressee must provide a response within 60 days of the date of this letter and describe the alternative course of action that it proposes to take, including the basis of the acceptability of the proposed alternative course of action and estimated completion date.

The required written response should be addressed to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, 11555 Rockville Pike, Rockville, MD 20852, under oath or affirmation under the provisions of Sections 161.c, 103.b, and 182.a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f). In addition, addressees should submit a copy of the response to the appropriate regional administrator.

## Staffing

### PURPOSE

The U.S. Nuclear Regulatory Commission (NRC or Commission) is issuing this information request to determine if additional regulatory action is warranted regarding the staff required to fill all necessary positions to respond to a multi-unit event.

Single unit sites should provide the requested information as it pertains to an extended loss of all ac power, and impeded access to the site.

### APPLICABLE REGULATORY REQUIREMENTS AND GUIDANCE

- Title 10 of the *Code of Federal Regulations* (10 CFR) 50.47(b)(1) states, in part: "... and each principal response organization has staff to respond and to augment its initial response on a continuous basis."

- 10 CFR 50.47(b)(2) states, in part: "... adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available, and..."

- NUREG-0654/FEMA-REP-1, Revision 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Section B, Onsite Emergency Organization, states in part:

  > Each licensee shall specify... functional areas of emergency activity... These assignments shall cover the emergency functions in Table B-1 entitled, 'Minimum Staffing Requirements for Nuclear Power Plant Emergencies.' The minimum on-shift staffing shall be as indicated in Table B-1. The licensee must be able to augment on-shift capabilities within a short period after declaration of an emergency. This capability shall be as indicated in Table B-1...

### DISCUSSION

The events in Japan have highlighted the importance of responders during all phases of emergency event response. The regulations require emergency response capabilities during a broad spectrum of postulated reactor accidents. A natural event on the scale of the 2011 Great East Japan Earthquake and resulting tsunami could present new challenges to personnel and their safety. Specifically, the event stressed the existing regulatory framework and impacted the operator's capability to implement adequate protective measures to protect the public and plant staff. In light of the experience from the event, the unavailability of sufficient onsite staff during the initial phase of the emergency condition, the unavailability of staff designated to augment the onsite staff, the inability for offsite support to reach the site, and the unavailability and inability of relief staff to reach the site, the NRC recognizes that these in total could pose challenges to licensee response efforts.

A large scale natural event may alter the planned emergency framework by changing access routes (e.g., bridges washed out, debris blocking roadways, etc.). While several utilities have implemented a combined emergency operations facility that is capable of handling multi-unit events, the onsite technical support center and operational support center at sites with multiple reactors have been designed to handle any emergency at only one of the units.

In conjunction with the Emergency Preparedness regulations Agencywide Documents Access and Management System (ADAMS) Accession No. ML112070125 published on November 10, 2011, the NRC published on December 5, 2011, in the *Federal Register* (76 FR 75771) interim staff guidance (ISG) in NSIR/DPR-ISG-01 ADAMS Accession No. ML1113010523. Section IV.C of the ISG provides guidance on performing an on-shift staffing analysis, and identified Nuclear Energy Institute (NEI)-10-05, "Assessment of On-shift Emergency Response Organizations Staffing and Capabilities" ADAMS Accession No. ML111751698, as an acceptable methodology for such an analysis. However, this methodology and guidance does not consider multiple unit events involving a large scale natural event with a loss of all alternating current (ac) power.

This letter requests that addresses assess and provide the NRC with information regarding the ability to implement their emergency plan during a large scale natural event that results in the following:

- all units affected,
- extended loss of all ac power, and
- impeded access to the sites

Addressees may find the capability for assessment activities, including repair team planning and preparation are particularly impacted. Therefore, it is requested that this assessment ensure that there is sufficient onsite staff and other resources to perform critical tasks until augmentation staff arrives to provide assistance and until other offsite resources become available.

## REQUESTED ACTIONS

It is requested that addressees assess their current staffing levels and determine the appropriate staff to fill all necessary positions for responding to a multi-unit event during a beyond design basis natural event and determine if any enhancements are appropriate given the considerations of Near-Term Task Force (NTTF) Recommendation 9.3.

Single unit sites should provide the requested information as it pertains to an extended loss of all ac power, and impeded access to the site.

## REQUESTED INFORMATION

1. It is requested that addressees provide an assessment of the onsite and augmented staff needed to respond to a large scale natural event meeting the conditions described above. This assessment should include a discussion of the onsite and augmented staff available to implement the strategies as discussed in the emergency plan and/or described in plant operating procedures. The following functions are requested to be assessed:

- How onsite staff will move back-up equipment (e.g., pumps, generators) from alternate onsite storage facilities to repair locations at each reactor as described in the Order regarding the NTTF Recommendation 4.2. It is requested that consideration be given to the major functional areas of NUREG-0654, Table B-1, such as plant operations and assessment of operational aspects, emergency direction and control, notification/communication, radiological accident assessment, and support of operational accident assessment, as appropriate.

- New staff or functions identified as a result of the assessment.

- Collateral duties (personnel not being prevented from timely performance of their assigned functions).

2. Provide an implementation schedule of the time needed to conduct the onsite and augmented staffing assessment. If any modifications are determined to be appropriate, please include in the schedule the time to implement the changes.

3. Identify how the augmented staff would be notified given degraded communications capabilities.

4. Identify the methods of access (e.g., roadways, navigable bodies of water and dockage, airlift, etc.) to the site that are expected to be available after a widespread large scale natural event.

5. Identify any interim actions that have been taken or are planned prior to the completion of the staffing assessment.

6. Identify changes that have been made or will be made to your emergency plan regarding the on-shift or augmented staffing changes necessary to respond to a loss of all ac power, multi-unit event, including any new or revised agreements with offsite resource providers (e.g., staffing, equipment, transportation, etc.).

**REQUIRED RESPONSE**

In accordance with Section 182.a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f), each addressee is requested to submit a written response consistent with the requested information. The response to requested information items 1 and 2 should be provided within 60 days of issuance of the ISG to be referenced in the NRC Order associated with NTTF Recommendation 4.2. The response to requested information items 3-6 should be provided within 90 days of the date of this letter.

If an addressee cannot meet the requested response date, the addressee must provide a response within 60 days of the date of this letter and describe the alternative course of action that it proposes to take, including the basis of the acceptability of the proposed alternative course of action and estimated completion date.

The required written response should be addressed to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, 11555 Rockville Pike, Rockville, MD 20852, under

oath or affirmation under the provisions of Sections 161.c, 103.b, and 182.a of the Atomic Energy Act of 1954, as amended and 10 CFR 50.54(f). In addition, addressees should submit a copy of the response to the appropriate regional administrator.

POWER REACTOR LICENSEES AND HOLDERS OF
CONSTRUCTION PERMITS IN ACTIVE OR DEFERRED STATUS

Arkansas Nuclear One
Entergy Operations, Inc.
Docket Nos. 50-313 and 50-368
License Nos. DPR-51 and NPF-6

Mr. Christopher J. Schwarz
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Entergy Operations, Inc.
Arkansas Nuclear One
1448 S.R. 333
Russellville, AR 72802

Beaver Valley Power Station
First Energy Nuclear Operating Co.
Docket Nos. 50-334 and 50-412
License Nos. DPR-66 and NPF-73

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Site Vice President
FirstEnergy Nuclear Operating Company
Mail Stop A-BV-SEB1
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Shippingport, PA 15077

Bellefonte Nuclear Power Station
Tennessee Valley Authority
Docket Nos. 50-438 and 50-439
Construction Permit Nos. CPPR No. 122 and CPPR No. 123

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Senior Vice President, Nuclear Generation Development and Construction
Tennessee Valley Authority
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1101 Market Street
Chattanooga, TN 37402-2801

Braidwood Station
Exelon Generation Co., LLC
Docket Nos. STN 50-456 and STN 50-457
License Nos. NPF-72 and NPF-77

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4300 Winfield Road
Warrenville, IL 60555

Browns Ferry Nuclear Plant
Tennessee Valley Authority
Docket Nos. 50-259, 50-260 and 50-296
License Nos. DPR-33, DPR-52 and DPR-68

Mr. Preston D. Swafford
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Brunswick Steam Electric Plant
Carolina Power & Light Co.
Docket Nos. 50-325 and 50-324
License Nos. DPR-71 and DPR-62

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Brunswick Steam Electric Plant
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Southport, NC 28461

Byron Station
Exelon Generation Co., LLC
Docket Nos. STN 50-454 and STN 50-455
License Nos. NPF-37 and NPF-66

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Callaway Plant
Union Electric Co.
Docket No. 50-483
License No. NPF-30

Mr. Adam C. Heflin
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Union Electric Company
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Fulton, MO 65251

Calvert Cliffs Nuclear Power Plant
Calvert Cliffs Nuclear Power Plant, LLC
Docket Nos. 50-317 and 50-318
License Nos. DPR-53 and DPR-69

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Calvert Cliffs Nuclear Power Plant, LLC
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Catawba Nuclear Station
Duke Energy Carolinas, LLC
Docket Nos. 50-413 and 50-414
License Nos. NPF-35 and NPF-52

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Clinton Power Station
Exelon Generation Co., LLC
Docket No. 50-461
License No. NPF-62

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Columbia Generating Station
Energy Northwest
Docket No. 50-397
License No. NPF-21

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Richland, WA 99352

Comanche Peak Nuclear Power Plant
Luminant Generation Co., LLC
Docket Nos. 50-445 and 50-446
License Nos. NPF-87 and NPF-89

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Luminant Generation Company, LLC
Attn: Regulatory Affairs
P. O. Box 1002
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Cooper Nuclear Station
Nebraska Public Power District
Docket No. 50-298
License No. DPR-46

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Crystal River Nuclear Generating Plant
Florida Power Corp.
Docket No. 50-302
License No. DPR-72

Mr. Jon A. Franke
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Attn: Supervisor, Licensing & Regulatory Affairs
Progress Energy, Inc.
Crystal River Nuclear Plant (NA2C)
15760 West Power Line Street
Crystal River, FL 34428-6708

Davis-Besse Nuclear Power Station
First Energy Nuclear Operating Co.
Docket No. 50-346
License No. NPF-3

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Oak Harbor, OH 43449-9760

Diablo Canyon Power Plant
Pacific Gas & Electric Co.
Docket Nos. 50-275 and 50-323
License Nos. DPR-80 and DPR-82

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Diablo Canyon Power Plant
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Donald C. Cook Nuclear Plant
Indiana Michigan Power Co.
Docket Nos. 50-315 and 50-316
License Nos. DPR-58 and DPR-74

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Dresden Nuclear Power Station
Exelon Generation Co., LLC
Docket Nos. 50-237 and 50-249
License Nos. DPR-19 and DPR-25

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Duane Arnold Energy Center
NextEra Energy Duane Arnold, LLC
Docket No. 50-331
License No. DPR-49

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Duane Arnold Energy Center
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Edwin I. Hatch Nuclear Plant
Southern Nuclear Operating Co.
Docket Nos. 50-321 and 50-366
License Nos. DPR-57 and NPF-5

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Fermi
Detroit Edison Co.
Docket No. 50-341
License No. NPF-43

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Fort Calhoun Station
Omaha Public Power District
Docket No. 50-285
License No. DPR-40

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Omaha Public Power District
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Omaha, NE 68102-2247

Grand Gulf Nuclear Station
Entergy Operations, Inc.
Docket No. 50-416
License No. NPF-29

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Grand Gulf Nuclear Station, Unit 1
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Port Gibson, MS 39150

H. B. Robinson Steam Electric Plant
Carolina Power & Light Co.
Docket No. 50-261
License No. DPR-23

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Hope Creek Generating Station
PSEG Nuclear, LLC
Docket No. 50-354
License No. NPF-57

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Indian Point Energy Center
Entergy Nuclear Operations, Inc.
Docket Nos. 50-247 and 50-286
License Nos. DPR-26 and DPR-64

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Indian Point Energy Center
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James A. FitzPatrick Nuclear Power Plant
Entergy Nuclear Operations, Inc.
Docket No. 50-333
License No. DPR-59

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James A. FitzPatrick Nuclear Power Plant
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Joseph M. Farley Nuclear Plant
Southern Nuclear Operating Co.
Docket Nos. 50-348 and 50-364
License Nos. NPF-2 and NPF-8

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Joseph M. Farley Nuclear Plant
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Kewaunee Power Station
Dominion Energy Kewaunee, Inc.
Docket No. 50-305
License No. DPR-43

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LaSalle County Station
Exelon Generation Co., LLC
Docket Nos. 50-373 and 50-374
License Nos. NPF-11 and NPF-18

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Limerick Generating Station
Exelon Generation Co., LLC
Docket Nos. 50-352 and 50-353
License Nos. NPF-39 and NPF-85

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Millstone Nuclear Power Station
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License Nos. DPR-65 and NPF-49

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Monticello Nuclear Generating Plant
Northern States Power Company
Docket No. 50-263
License No. DPR-22

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Nine Mile Point Nuclear Station
Nine Mile Point Nuclear Station, LLC
Docket Nos. 50-220 and 50-410
License Nos. DPR-63 and NPF-69

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North Anna Power Station
Virginia Electric & Power Co.
Docket Nos. 50-338 and 50-339
License Nos. NPF-4 and NPF-7

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Oconee Nuclear Station
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Docket Nos. 50-269, 50-270 and 50-287
License Nos. DPR-38, DPR-47 and DPR-55

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Oyster Creek Nuclear Generating Station
Exelon Generation Co., LLC
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License No. DPR-16

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Palisades Nuclear Plant
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Palo Verde Nuclear Generating Station
Arizona Public Service Company
Docket Nos. STN 50-528, STN 50-529 and STN 50-530
License Nos. NPF-41, NPF-51 and NPF-74

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Peach Bottom Atomic Power Station
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Docket Nos. 50-277 and 50-278
License Nos. DPR-44 and DPR-56

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Pilgrim Nuclear Power Station Unit No. 1
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License No. DPR-35

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Point Beach Nuclear Plant
NextEra Energy Point Beach, LLC
Docket Nos. 50-266 and 50-301
License Nos. DPR-24 and DPR-27

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Prairie Island Nuclear Generating Plant
Northern States Power Co. Minnesota
Docket Nos. 50-282 and 50-306
License Nos. DPR-42 and DPR-60

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Quad Cities Nuclear Power Station
Exelon Generation Co., LLC
Docket Nos. 50-254 and 50-265
License Nos. DPR-29 and DPR-30

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R. E. Ginna Nuclear Power Plant
R.E. Ginna Nuclear Power Plant, LLC
Docket No. 50-244
License No. DPR-18

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River Bend Station
Entergy Operations, Inc.
Docket No. 50-458
License No. NPF-47

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River Bend Station
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St. Francisville, LA 70775

Salem Nuclear Generating Station
PSEG Nuclear, LLC
Docket Nos. 50-272 and 50-311
License Nos. DPR-70 and DPR-75

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San Onofre Nuclear Generating Station
Southern California Edison Co.
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License Nos. NPF-10 and NPF-15

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Seabrook
NextEra Energy Seabrook, LLC
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License No. NPF-86

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Sequoyah Nuclear Plant
Tennessee Valley Authority
Docket Nos. 50-327 and 50-328
License Nos. DPR-77 and DPR-79

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Shearon Harris Nuclear Power Plant
Carolina Power & Light Co.
Docket No. 50-400
License No. NPF-63

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South Texas Project
STP Nuclear Operating Co.
Docket Nos. 50-498 and 50-499
License Nos. NPF-76 and NPF-80

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St. Lucie Plant
Florida Power & Light Co.
Docket Nos. 50-335 and 50-389
License Nos. DPR-67 and NPF-16

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Surry Power Station
Virginia Electric & Power Co.
Docket Nos. 50-280 and 50-281
License Nos. DPR-32 and DPR-37

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Nuclear
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

Susquehanna Steam Electric Station
PPL Susquehanna, LLC
Docket Nos. 50-387 and 50-388
License Nos. NPF-14 and NPF-22

Mr. Timothy S. Rausch
Senior Vice President and Chief Nuclear Officer
PPL Susquehanna, LLC
769 Salem Boulevard
NUCSB3
Berwick, PA 18603-0467

Turkey Point
Florida Power & Light Co.
Docket Nos. 50-250 and 50-251
License Nos. DPR-31 and DPR-41

Mr. Mano Nazar
Executive Vice President and Chief Nuclear Officer
NextEra Energy
700 Universe Boulevard
P. O. Box 14000
Juno Beach, FL 33408-0420

Vermont Yankee Nuclear Power Station
Entergy Nuclear Operations, Inc.
Docket No. 50-271
License No. DPR-28

Mr. Christopher J. Wamser
Site Vice President
Entergy Nuclear Operations, Inc.
Vermont Yankee Nuclear Power Station
320 Governor Hunt Road
Vernon, VT 05354

Virgil C. Summer Nuclear Station
South Carolina Electric & Gas Co.
Docket No. 50-395
License No. NPF-12

Mr. Thomas D. Gatlin
Vice President Nuclear Operations
South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station
Post Office Box 88, Mail Code 300
Jenkinsville, SC 29065

Vogtle Electric Generating Plant
Southern Nuclear Operating Co.
Docket Nos. 50-424 and 50-425
License Nos. NPF-68 and NPF-81

Mr. Tom E. Tynan
Vice President
Southern Nuclear Operating Company, Inc.
Vogtle Electric Generating Plant
7821 River Road
Waynesboro, GA 30830

Vogtle Electric Generating Plant, Units 3 & 4
Southern Nuclear Operating Co.
Docket Nos. 52-025 and 52-026
License Nos. NPF-91 and NPF-92

Mr. B. L. Ivey
Vice President, Regulatory Affairs
Southern Nuclear Operating Company, Inc.
40 Inverness Center Parkway
Bin B022
Birmingham, AL 35242

Waterford Steam Electric Station
Entergy Operations, Inc.
Docket No. 50-382
License No. NPF-38

Ms. Donna Jacobs
Vice President, Operations
Entergy Operations, Inc.
Waterford Steam Electric Station, Unit 3
17265 River Road
Killona, LA 70057-0751

Watts Bar Nuclear Plant, Unit 1
Tennessee Valley Authority
Docket No. 50-390
License No. NPF-90

Mr. Preston D. Swafford
Chief Nuclear Officer and Executive Vice President
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Watts Bar Nuclear Plant, Unit 2
Tennessee Valley Authority
Docket No. 50-391
Construction Permit No. CPPR No. 092

Mr. Michael D. Skaggs
Senior Vice President, Nuclear Generation Development and Construction
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

William B. McGuire Nuclear Station
Duke Energy Carolinas, LLC
Docket Nos. 50-369 and 50-370
License Nos. NPF-9 and NPF-17

Mr. Regis T. Repko
Vice President
Duke Energy Carolinas, LLC
McGuire Nuclear Site
12700 Hagers Ferry Road
Huntersville, NC 28078

Wolf Creek Generating Station
Wolf Creek Nuclear Operating Corp.
Docket No. 50-482
License No. NPF-42

Mr. Matthew W. Sunseri
President and Chief Executive Officer
Wolf Creek Nuclear Operating Corporation
P. O. Box 411
Burlington, KS 66839

If you have any questions on this matter, please contact your NRC licensing Project Manager.

Sincerely,

***/ra/***

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation

Michael R. Johnson, Director
Office of New Reactors

Enclosures:
1. Recommendation 2.1: Seismic
2. Recommendation 2.1: Flooding
3. Recommendation 2.3: Seismic
4. Recommendation 2.3: Flooding
5. Recommendation 9.3: EP
6. Licensees and Holders of Construction Permits

cc: Listserv

Distribution: See next page

**ADAMS Accession Nos.:** ML12056A046 (Pkg.), ML12053A340 (Ltr.) *e-mail concurrence

| **OFFICE** | PM: NRR/JLD | PM: NRR/JLD | PM: NRR/JLD | LA: NRR/JLD | QTE* |
|---|---|---|---|---|---|
| **NAME** | GEMiller | JKratchman | CGratton | SRohrer | JDoughtery |
| **DATE** | 03/12/2012 | 03/ 12 /2012 | 03/12/2012 | 03/12/2012 | 02/05/2012 |
| **OFFICE** | BC: NRR/JLD | D: JLD* | OGC* | OD: NRO | OD: NRR |
| **NAME** | RPascarelli | DSkeen | MSpencer | MJohnson | ELeeds |
| **DATE** | 03/11/2012 | 03/11/2012 | 03/11/2012 | 03/ 12 /2012 | 03/ 12 /2012 |

**OFFICIAL RECORD COPY**

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 12, 2012

EA-12-051

All Power Reactor Licensees and
Holders of Construction Permits in
Active or Deferred Status

SUBJECT: ISSUANCE OF ORDER TO MODIFY LICENSES WITH REGARD TO RELIABLE SPENT FUEL POOL INSTRUMENTATION

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Order that modifies the current license for your facility. The Order requires provisions for reliable spent fuel pool indications and applies to all addressees listed in Attachment 1 to the enclosed Order.

Following the earthquake and tsunami at the Fukushima Dai-ichi nuclear power plant in March 2011, the NRC established a senior-level task force referred to as the Near-Term Task Force (NTTF). The NTTF conducted a systematic and methodical review of the NRC regulations and processes to determine if the agency should make safety improvements in light of the events in Japan. As a result of this review, the NTTF issued SECY-11-0093, "Near-Term Report and Recommendations for Agency Actions Following the Events in Japan" (Agencywide Document Access and Management System (ADAMS) Accession No. ML11186A950). SECY 11-0124, "Recommended Actions to be Taken Without Delay from the Near-Term Task Force Report," (ADAMS Accession No. ML112911571) and SECY-11-0137, "Prioritization of Recommended Actions to be Taken in Response to Fukushima Lessons Learned," (ADAMS Accession No. ML11272A111) were issued to establish the NRC staff's prioritization of the recommendations. Recommendation 7.1, concerning reliable spent fuel pool instrumentation, was determined to be a high-priority action. This Order is based upon the NTTF recommendation.

During the events in Fukushima, responders were without reliable instrumentation to determine water level in the spent fuel pool. This caused concerns that the pool may have boiled dry, resulting in fuel damage. Numerous attempts were made to refill the spent fuel pools, which diverted resources and attention from other efforts. The events at Fukushima demonstrated the confusion and misapplication of resources that can result from beyond-design-basis external events when adequate instrumentation is not available.

The NRC staff has determined that the current fleet of nuclear power plants is safe to continue operation. Additionally, the Commission has determined that the enhanced spent fuel pool instrumentation required by this Order represents a substantial increase in protection to public health and safety. The requirements of this Order are immediately effective and are expected to remain in place until superseded by Order or rule.

Pursuant to Section 223 of the Atomic Energy Act of 1954, as amended, any person who willfully violates, attempts to violate, or conspires to violate, any provision of this Order shall be subject to criminal prosecution as set forth in that section. Violation of this Order may also subject the person to civil monetary penalty.

The enclosed Order requires responses and actions within specified timeframes. Please contact your Licensing Project Manager or Mrs. Lisa Regner, Spent Fuel Pool Instrumentation Order Project Manager (301-415-1906), regarding any issues related to compliance with the requirements in the enclosed Order, or if you have other questions.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. The NRC also includes significant enforcement actions on its Web site at (http://www.nrc.gov/reading-rm/doc-collections/enforcement/actions/. The enclosed Order has been forwarded to the Office of the *Federal Register* for publication.

Sincerely,

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation

Michael R. Johnson, Director
Office of New Reactors

Enclosure:
Order (EA-12-051)

cc: Listserv

ORDER TO MODIFY LICENSES WITH REGARD TO RELIABLE
SPENT FUEL POOL INSTRUMENTATION
EA-12-051

Enclosure

7590-01-P

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

| | | |
|---|---|---|
| In the Matter of | ) | |
| | ) | |
| ALL POWER REACTOR | ) | Docket Nos. (as shown in Attachment 1) |
| LICENSEES AND HOLDERS | ) | License Nos. (as shown in Attachment 1) or |
| OF CONSTRUCTION PERMITS IN | ) | Construction Permit Nos. (as shown in |
| ACTIVE OR DEFERRED STATUS | ) | Attachment 1) |
| | ) | |
| | ) | EA-12-051 |

# ORDER MODIFYING LICENSES WITH REGARD TO RELIABLE SPENT FUEL POOL INSTRUMENTATION (EFFECTIVE IMMEDIATELY)

I.

The Licensees and construction permit (CP) holders[1] identified in Attachment 1 to this Order hold licenses issued by the U.S. Nuclear Regulatory Commission (NRC or Commission) authorizing operation and/or construction of nuclear power plants in accordance with the Atomic Energy Act of 1954, as amended, and Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," and Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants."

II.

On March 11, 2011, a magnitude 9.0 earthquake struck off the coast of the Japanese island of Honshu. The earthquake resulted in a large tsunami, estimated to have exceeded 14 meters (45 feet) in height, that inundated the Fukushima Dai-ichi nuclear power plant site.

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[1] *CP holders, as used in this Order, includes CPs, in active or deferred status, as identified in Attachment 1 to this Order (i.e., Watts Bar, Unit 2; and Bellefonte, Units 1 and 2)*

The earthquake and tsunami produced widespread devastation across northeastern Japan and significantly affected the infrastructure and industry in the northeastern coastal areas of Japan.

When the earthquake occurred, Fukushima Dai-ichi Units 1, 2, and 3 were in operation and Units 4, 5, and 6 were shut down for routine refueling and maintenance activities. The Unit 4 reactor fuel was offloaded to the Unit 4 spent fuel pool. Following the earthquake, the three operating units automatically shut down and offsite power was lost to the entire facility. The emergency diesel generators (EDGs) started at all six units providing alternating current (ac) electrical power to critical systems at each unit. The facility response to the earthquake appears to have been normal.

Approximately 40 minutes following the earthquake and shutdown of the operating units, the first large tsunami wave inundated the site, followed by additional waves. The tsunami caused extensive damage to site facilities and resulted in a complete loss of all ac electrical power at Units 1 through 5, a condition known as station blackout. In addition, all direct current electrical power was lost early in the event on Units 1 and 2 and after some period of time at the other units. Unit 6 retained the function of one air-cooled EDG. Despite their actions, the operators lost the ability to cool the fuel in the Unit 1 reactor after several hours, in the Unit 2 reactor after about 70 hours, and in the Unit 3 reactor after about 36 hours, resulting in damage to the nuclear fuel shortly after the loss of cooling capabilities.

The Unit 4 spent fuel pool contained the highest heat load of the six units with the full core present in the spent fuel pool and the refueling gates installed. However, because Unit 4 had been shut down for more than 3 months, the heat load was low relative to that present in spent fuel pools immediately following shutdown for reactor refueling. Following the earthquake and tsunami, the operators in the Units 3 and 4 control room focused their efforts on stabilizing the Unit 3 reactor. During the event, concern grew that the spent fuel was overheating, causing a

high-temperature reaction of steam and zirconium fuel cladding generating hydrogen gas. This concern persisted primarily due to a lack of readily available and reliable information on water levels in the spent fuel pools. Helicopter water drops, water cannons, and cement delivery vehicles with articulating booms were used to refill the pools, which diverted resources and attention from other efforts. Subsequent analysis determined that the water level in the Unit 4 spent fuel pool did not drop below the top of the stored fuel and no significant fuel damage occurred. The lack of information on the condition of the spent fuel pools contributed to a poor understanding of possible radiation releases and adversely impacted effective prioritization of emergency response actions by decision makers.

Following the events at the Fukushima Dai-ichi nuclear power plant, the NRC established a senior-level agency task force referred to as the Near-Term Task Force (NTTF). The NTTF was tasked with conducting a systematic and methodical review of the NRC regulations and processes and determining if the agency should make additional improvements to these programs in light of the events at Fukushima Dai-ichi. As a result of this review, the NTTF developed a comprehensive set of recommendations, documented in SECY-11-0093, "Near-Term Report and Recommendations for Agency Actions Following the Events in Japan," dated July 12, 2011. These recommendations were modified by the NRC staff following interactions with stakeholders. Documentation of the NRC staff's efforts is contained in SECY-11-0124, "Recommended Actions To Be Taken Without Delay From the Near-Term Task Force Report," dated September 9, 2011, and SECY-11-0137, "Prioritization of Recommended Actions To Be Taken in Response to Fukushima Lessons Learned," dated October 3, 2011.

As directed by the Commission's Staff Requirements Memorandum (SRM) for SECY-11-0093, the NRC staff reviewed the NTTF recommendations within the context of the NRC's existing regulatory framework and considered the various regulatory vehicles available to

the NRC to implement the recommendations. SECY-11-0124 and SECY-11-0137 established the NRC staff's prioritization of the recommendations based upon the potential safety enhancements.

Current regulatory requirements and existing plant capabilities allow the NRC to conclude that a sequence of events such as the Fukushima Dai-ichi accident is unlikely to occur in the United States. Therefore, continued operation and continued licensing activities do not pose an imminent threat to public health and safety. However, the NRC's assessment of new insights from the events at Fukushima Dai-ichi leads the NRC staff to conclude that additional requirements must be imposed on Licensees and CP holders to increase the capability of nuclear power plants to mitigate beyond-design-basis external events. These additional requirements represent a substantial increase in the protection of public health and safety. The Commission has decided to administratively exempt this Order from applicable provisions of the Backfit Rule, 10 CFR 50.109, and the issue finality requirements in 10 CFR 52.63 and 10 CFR Part 52, Appendix D, Paragraph VIII.

Additional details on an acceptable approach for complying with this Order will be contained in final interim staff guidance (ISG) scheduled to be issued by the NRC in August 2012. This guidance will include a template to be used for the plan that will be submitted in accordance with Section IV, Condition C.1 below.

III.

Reasonable assurance of adequate protection of public health and safety and assurance of the common defense and security are the fundamental NRC regulatory objectives. Compliance with NRC requirements plays a critical role in giving the NRC confidence that Licensees and CP holders are maintaining an adequate level of public health and safety and common defense and security. While compliance with NRC requirements presumptively

ensures adequate protection, new information may reveal that additional requirements are warranted. In such situations, the Commission may act in accordance with its statutory authority under Section 161 of the Atomic Energy Act of 1954, as amended, to require Licensees and CP holders to take action in order to protect health and safety and common defense and security.

To protect public health and safety from the inadvertent release of radioactive materials, the NRC's defense-in-depth strategy includes multiple layers of protection: (1) prevention of accidents by virtue of the design, construction, and operation of the plant; (2) mitigation features to prevent radioactive releases should an accident occur; and (3) emergency preparedness programs that include measures such as sheltering and evacuation. The defense-in-depth strategy also provides for multiple physical barriers to contain the radioactive materials in the event of an accident. The barriers are the fuel cladding, the reactor coolant pressure boundary, and the containment. These defense-in-depth features are embodied in the existing regulatory requirements and thereby provide adequate protection of public health and safety.

In the case of spent fuel pools, compliance with existing regulations and guidance presumptively provides reasonable assurance of the safe storage of spent fuel. In particular, Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50 establishes the general design criteria (GDC) for nuclear power plants. All currently operating reactors were licensed to the GDC or meet the intent of the GDC. The GDC provide the design features of the spent fuel storage and handling systems and the protection of these systems from natural phenomena and operational events. The accidents considered during licensing of U.S. nuclear power plants typically include failure of the forced cooling system and loss of spent fuel pool inventory at a specified rate within the capacity of the makeup water system. Further, spent fuel pools at U.S. nuclear power plants rely on maintenance of an adequate inventory of water under accident conditions to provide containment, as well as the cooling and shielding safety functions.

During the events in Fukushima, responders were without reliable instrumentation to determine water level in the spent fuel pool. This caused concerns that the pool may have boiled dry, resulting in fuel damage.[2] Fukushima demonstrated the confusion and misapplication of resources that can result from beyond-design-basis external events when adequate instrumentation is not available.

The spent fuel pool level instrumentation at U.S. nuclear power plants is typically narrow range and, therefore, only capable of monitoring normal and slightly off-normal conditions. Although the likelihood of a catastrophic event affecting nuclear power plants and the associated spent fuel pools in the United States remains very low, beyond-design-basis external events could challenge the ability of existing instrumentation to provide emergency responders with reliable information on the condition of spent fuel pools. Reliable and available indication is essential to ensure plant personnel can effectively prioritize emergency actions.

The Commission has determined that the spent fuel pool instrumentation required by this Order represents a significant enhancement to the protection of public health and safety and is an appropriate response to the insights from the Fukushima Dai-ichi accident. While this consideration is qualitative in nature, the Commission has long taken the position that the determination as to whether proposed backfits represent a substantial safety improvement may be qualitative in nature. Staff Requirements Memorandum, SECY-93-086, "Backfit Considerations" (June 30, 1993), pp. 1-2. However the Commission does not, at this time, have sufficient information to complete a full backfit analysis of the spent fuel pool instrumentation that would be required by this Order. The NRC is analyzing the insights gained from the Fukushima Dai-ichi accident on an accelerated timeline. Additionally, the NRC has considered the

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[2] *See Institute of Nuclear Power Operations (INPO) 11-005, "Special Report on the Nuclear Accident at the Fukushima Daiichi Nuclear Power Station," Revision 0, issued November 2011, p. 36.*

Congressional intent that the agency act expeditiously on Tier 1 recommendations.

The Commission has recognized, in exceptional circumstances, that some proposed rules may not meet the requirements specified in the Backfit Rule but nevertheless should be adopted by the NRC. Hence, the Commission advised the NRC staff that it would consider, on a case-by-case basis, whether a proposed regulatory action should be adopted as an "exception" to the Backfit Rule. This Order represents such a case. Therefore, the Commission has decided to administratively exempt this Order from the Backfit Rule and the issue finality requirements in 10 CFR 52.63 and 10 CFR Part 52, Appendix D, paragraph VIII for several reasons.

The Fukushima Dai-ichi accident was unprecedented in terms of initiating cause and the particular failure sequence. In addition, our review of this event has highlighted the benefits that can be derived from the availability of more diverse instrumentation. Consistent with the final Aircraft Impact Assessment Rule, 10 CFR 50.150, 74 FR 28112 (June 12, 2009), the Commission's decision to administratively exempt this Order from compliance with the Backfit Rule is a highly exceptional action limited to the insights associated with the extraordinary underlying circumstances of the Fukushima Dai-ichi accident and the NRC's lessons learned. Furthermore, the extensive stakeholder engagement and broad endorsement for timely action support the Commission's judgment that immediate action to commence implementation of the spent fuel monitoring requirements is warranted at this time. In addition, pursuant to 10 CFR 2.202, the NRC finds that the public health, safety, and interest require that this Order be made immediately effective.

Based upon the considerations set forth above, the Commission has determined that all power reactor licensees and CP holders must have a reliable means of remotely monitoring wide-range spent fuel pool levels to support effective prioritization of event mitigation and recovery actions in the event of a beyond-design-basis external event. These new requirements

provide a greater capability, consistent with the overall defense-in-depth philosophy, and therefore greater assurance of protection of public health and safety from the challenges posed by beyond-design-basis external events to power reactors. Accordingly, the Commission concludes that all operating reactor licensees and CPs under Part 50 identified in Attachment 1 to this Order shall be modified to include the requirements identified in Attachment 2 to this Order. All combined licenses (COLs) under Part 52 identified in Attachment 1 to this Order shall be modified to include the requirements identified in Attachment 3 to this Order.

IV.

Accordingly, pursuant to Sections 161b, 161i, 161o, and 182 of the Atomic Energy Act of 1954, as amended, and the Commission's regulations in 10 CFR 2.202, and 10 CFR Parts 50 and 52, IT IS HEREBY ORDERED, EFFECTIVE IMMEDIATELY, THAT ALL LICENSES AND CONSTRUCTION PERMITS IDENTIFIED IN ATTACHMENT 1 TO THIS ORDER ARE MODIFIED AS FOLLOWS:

A. 1. All holders of CPs issued under Part 50 shall, notwithstanding the provisions of any Commission regulation or CP to the contrary, comply with the requirements described in Attachment 2 to this Order except to the extent that a more stringent requirement is set forth in the CP. These CP holders shall complete full implementation **prior to issuance of an operating license.**

2. All holders of operating licenses issued under Part 50 shall, notwithstanding the provisions of any Commission regulation or license to the contrary, comply with the requirements described in Attachment 2 to this Order except to the extent that a more stringent requirement is set forth in the license. These Licensees shall promptly start implementation of the requirements in Attachment 2 to the Order and shall complete full implementation **no later than two (2) refueling cycles**

**after submittal of the overall integrated plan, as required in Condition C.1.a, or December 31, 2016, whichever comes first.**

3. All holders of COLs issued under Part 52 shall, notwithstanding the provisions of any Commission regulation or license to the contrary, comply with the requirements described in Attachment 3 to this Order except to the extent that a more stringent requirement is set forth in the license. These Licensees shall promptly start implementation of the requirements in Attachment 3 to the Order and shall complete full implementation prior to initial fuel load.

B. 1. All Licensees and CP holders shall, **within twenty (20) days** of the date of this Order, notify the Commission (1) if they are unable to comply with any of the requirements described in Attachment 2 or Attachment 3, (2) if compliance with any of the requirements is unnecessary in their specific circumstances, or (3) if implementation of any of the requirements would cause the Licensee or CP holder to be in violation of the provisions of any Commission regulation or the facility license. The notification shall provide the Licensee's or CP holder's justification for seeking relief from or variation of any specific requirement.

2. Any Licensee or CP holder that considers that implementation of any of the requirements described in Attachment 2 or Attachment 3 to this Order would adversely impact safe and secure operation of the facility must notify the Commission, **within twenty (20) days** of this Order, of the adverse impact, the basis for its determination that the requirement has an adverse impact, and either a proposal for achieving the same objectives specified in the Attachment 2 or Attachment 3 requirement in question, or a schedule for modifying the facility to address the adverse condition. If neither approach is appropriate, the Licensee

or CP holder must supplement its response to Condition B.1 of this Order to identify the condition as a requirement with which it cannot comply, with attendant justifications as required in Condition B.1.

C. 1. a. All holders of operating licenses issued under Part 50 shall **by February 28, 2013**, submit to the Commission for review an overall integrated plan, including a description of how compliance with the requirements described in Attachment 2 will be achieved.

b. All holders of CPs issued under Part 50 or COLs issued under Part 52 shall, **within one (1) year** after issuance of the final ISG, submit to the Commission for review an overall integrated plan, including a description of how compliance with the requirements described in Attachment 2 or Attachment 3 will be achieved.

2. All Licensees and CP holders shall provide an initial status report **sixty (60) days** after the issuance of the final ISG, and **at six (6)-month intervals** following submittal of the overall integrated plan, as required in Condition C.1, which delineates progress made in implementing the requirements of this Order.

3. All Licensees and CP holders shall report to the Commission when full compliance with the requirements described in Attachment 2 or Attachment 3 is achieved.

Licensee or CP holder responses to Conditions B.1, B.2, C.1, C.2, and C.3, above, shall be submitted in accordance with 10 CFR 50.4 and 10 CFR 52.3, as applicable.

As applicable, the Director, Office of Nuclear Reactor Regulation or the Director, Office of New Reactors may, in writing, relax or rescind any of the above conditions upon demonstration by the Licensee or CP holder of good cause.

V.

In accordance with 10 CFR 2.202, the Licensee or CP holder must, and any other person adversely affected by this Order may, submit an answer to this Order, and may request a hearing on this Order, **within twenty (20) days** of the date of this Order. Where good cause is shown, consideration will be given to extending the time to answer or to request a hearing. A request for extension of time in which to submit an answer or request a hearing must be made in writing to the Director, Office of Nuclear Reactor Regulation or to the Director, Office of New Reactors, U.S. Nuclear Regulatory Commission, Washington, DC 20555, and include a statement of good cause for the extension. The answer may consent to this Order.

If a hearing is requested by a Licensee, CP holder, or a person whose interest is adversely affected, the Commission will issue an Order designating the time and place of any hearings. If a hearing is held, the issue to be considered at such hearing shall be whether this Order should be sustained. Pursuant to 10 CFR 2.202(c)(2)(i), the Licensee, CP holder, or any other person adversely affected by this Order, may, in addition to demanding a hearing, at the time the answer is filed or sooner, move the presiding officer to set aside the immediate effectiveness of the Order on the ground that the Order, including the need for immediate effectiveness, is not based on adequate evidence but on mere suspicion, unfounded allegations, or error.

All documents filed in NRC adjudicatory proceedings, including a request for hearing, a petition for leave to intervene, any motion or other document filed in the proceeding prior to the submission of a request for hearing or petition to intervene, and documents filed by interested governmental entities participating under 10 CFR 2.315(c), must be filed in accordance with the NRC E-Filing rule (72 FR 49139, August 28, 2007). The E-Filing process requires participants to submit and serve all adjudicatory documents over the internet, or in some cases to mail copies on

electronic storage media. Participants may not submit paper copies of their filings unless they seek an exemption in accordance with the procedures described below.

To comply with the procedural requirements of E-Filing, at least 10 days prior to the filing deadline, the participant should contact the Office of the Secretary by e-mail at hearing.docket@nrc.gov, or by telephone at (301) 415-1677, to request (1) a digital ID certificate, which allows the participant (or its counsel or representative) to digitally sign documents and access the E-Submittal server for any proceeding in which it is participating; and (2) advise the Secretary that the participant will be submitting a request or petition for hearing (even in instances in which the participant, or its counsel or representative, already holds an NRC-issued digital ID certificate). Based upon this information, the Secretary will establish an electronic docket for the hearing in this proceeding if the Secretary has not already established an electronic docket.

Information about applying for a digital ID certificate is available on NRC's public Web site at *http://www.nrc.gov/site-help/e-submittals/apply-certificates.html*. System requirements for accessing the E-Submittal server are detailed in NRC's "Guidance for Electronic Submission," which is available on the agency's public Web site at *http://www.nrc.gov/site-help/esubmittals.html*. Participants may attempt to use other software not listed on the web site, but should note that the NRC's E-Filing system does not support unlisted software, and the NRC Meta System Help Desk will not be able to offer assistance in using unlisted software.

If a participant is electronically submitting a document to the NRC in accordance with the E-Filing rule, the participant must file the document using the NRC's online, web-based submission form. In order to serve documents through the Electronic Information Exchange, users will be required to install a web browser plug-in from the NRC web site. Further information

on the web-based submission form, including the installation of the Web browser plug-in, is available on the NRC's public Web site at *http://www.nrc.gov/site-help/esubmittals.html*.

Once a participant has obtained a digital ID certificate and a docket has been created, the participant can then submit a request for hearing or petition for leave to intervene. Submissions should be in Portable Document Format (PDF) in accordance with NRC guidance available on the NRC public Web site at *http://www.nrc.gov/site-help/e-submittals.html*. A filing is considered complete at the time the documents are submitted through the NRC's E-Filing system. To be timely, an electronic filing must be submitted to the E-Filing system no later than 11:59 p.m. Eastern Time on the due date. Upon receipt of a transmission, the E-Filing system time-stamps the document and sends the submitter an e-mail notice confirming receipt of the document. The E-Filing system also distributes an e-mail notice that provides access to the document to the NRC Office of the General Counsel and any others who have advised the Office of the Secretary that they wish to participate in the proceeding, so that the filer need not serve the documents on those participants separately. Therefore, applicants and other participants (or their counsel or representative) must apply for and receive a digital ID certificate before a hearing request/petition to intervene is filed so that they can obtain access to the document via the E-Filing system.

A person filing electronically using the agency's adjudicatory E-Filing system may seek assistance by contacting the NRC Meta System Help Desk through the "Contact Us" link located on the NRC Web site at *http://www.nrc.gov/site-help/e-submittals.html*, by e-mail at MSHD.Resource@nrc.gov, or by a toll-free call at (866) 672-7640. The NRC Meta System Help Desk is available between 8 a.m. and 8 p.m., Eastern Time, Monday through Friday, excluding government holidays.

Participants who believe that they have a good cause for not submitting documents electronically must file an exemption request, in accordance with 10 CFR 2.302(g), with their

initial paper filing requesting authorization to continue to submit documents in paper format. Such filings must be submitted by: (1) first class mail addressed to the Office of the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, Attention: Rulemaking and Adjudications Staff; or (2) courier, express mail, or expedited delivery service to the Office of the Secretary, Sixteenth Floor, One White Flint North, 11555 Rockville Pike, Rockville, Maryland, 20852, Attention: Rulemaking and Adjudications Staff. Participants filing a document in this manner are responsible for serving the document on all other participants. Filing is considered complete by first-class mail as of the time of deposit in the mail, or by courier, express mail, or expedited delivery service upon depositing the document with the provider of the service. A presiding officer, having granted an exemption request from using E-Filing, may require a participant or party to use E-Filing if the presiding officer subsequently determines that the reason for granting the exemption from use of E-Filing no longer exists.

Documents submitted in adjudicatory proceedings will appear in NRC's electronic hearing docket, which is available to the public at *http://ehd.nrc.gov/EHD_Proceeding/home.asp*, unless excluded pursuant to an order of the Commission, or the presiding officer. Participants are requested not to include personal privacy information, such as social security numbers, home addresses, or home phone numbers in their filings, unless an NRC regulation or other law requires submission of such information. With respect to copyrighted works, except for limited excerpts that serve the purpose of the adjudicatory filings and would constitute a Fair Use application, participants are requested not to include copyrighted materials in their submission.

If a person other than the Licensee or CP holder requests a hearing, that person shall set forth with particularity the manner in which his interest is adversely affected by this Order and shall address the criteria set forth in 10 CFR 2.309(d).

In the absence of any request for hearing, or written approval of an extension of time in which to request a hearing, the provisions specified in Section IV above shall be final twenty (20) days from the date of this Order without further order or proceedings. If an extension of time for requesting a hearing has been approved, the provisions specified in Section IV shall be final when the extension expires if a hearing request has not been received. AN ANSWER OR A REQUEST FOR HEARING SHALL NOT STAY THE IMMEDIATE EFFECTIVENESS OF THIS ORDER.

FOR THE NUCLEAR REGULATORY COMMISSION

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation

Michael R. Johnson, Director
Office of New Reactors

Dated this 12th day of March 2012

POWER REACTOR LICENSEES AND LICENSEES
WITH ACTIVE AND/OR DEFERRED CONSTRUCTION PERMITS

Arkansas Nuclear One
Entergy Operations, Inc.
Docket Nos. 50-313 and 50-368
License Nos. DPR-51 and NPF-6

Mr. Christopher J. Schwarz
Vice President, Operations
Entergy Operations, Inc.
Arkansas Nuclear One
1448 S.R. 333
Russellville, AR 72802

Beaver Valley Power Station
First Energy Nuclear Operating Co.
Docket Nos. 50-334 and 50-412
License Nos. DPR-66 and NPF-73

Mr. Paul A. Harden
Site Vice President
FirstEnergy Nuclear Operating Company
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Shippingport, PA 15077

Bellefonte Nuclear Power Station
Tennessee Valley Authority
Docket Nos. 50-438 and 50-439
Construction Permit Nos. CPPR No. 122 and CPPR No. 123

Mr. Michael D. Skaggs
Senior Vice President, Nuclear Generation Development and Construction
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Braidwood Station
Exelon Generation Co., LLC
Docket Nos. STN 50-456 and STN 50-457
License Nos. NPF-72 and NPF-77

Mr. Michael J. Pacilio
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Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

Browns Ferry Nuclear Plant
Tennessee Valley Authority
Docket Nos. 50-259, 50-260 and 50-296
License Nos. DPR-33, DPR-52 and DPR-68

Mr. Preston D. Swafford
Chief Nuclear Officer and Executive Vice President
Tennessee Valley Authority
3R Lookout Place
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Chattanooga, TN 37402-2801

Brunswick Steam Electric Plant
Carolina Power & Light Co.
Docket Nos. 50-325 and 50-324
License Nos. DPR-71 and DPR-62

Mr. Michael J. Annacone
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Carolina Power & Light Company
Brunswick Steam Electric Plant
P. O. Box 10429
Southport, NC 28461

Byron Station
Exelon Generation Co., LLC
Docket Nos. STN 50-454 and STN 50-455
License Nos. NPF-37 and NPF-66

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Callaway Plant
Union Electric Co.
Docket No. 50-483
License No. NPF-30

Mr. Adam C. Heflin
Senior Vice President and Chief Nuclear Officer
Union Electric Company
P. O. Box 620
Fulton, MO 65251

Calvert Cliffs Nuclear Power Plant
Calvert Cliffs Nuclear Power Plant, LLC
Docket Nos. 50-317 and 50-318
License Nos. DPR-53 and DPR-69

Mr. George H. Gellrich
Vice President
Calvert Cliffs Nuclear Power Plant, LLC
Calvert Cliffs Nuclear Power Plant
1650 Calvert Cliffs Parkway
Lusby, MD 20657-4702

Catawba Nuclear Station
Duke Energy Carolinas, LLC
Docket Nos. 50-413 and 50-414
License Nos. NPF-35 and NPF-52

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Duke Energy Carolinas, LLC
Catawba Nuclear Station
4800 Concord Road
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Clinton Power Station
Exelon Generation Co., LLC
Docket No. 50-461
License No. NPF-62

Mr. Michael J. Pacilio
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Columbia Generating Station
Energy Northwest
Docket No. 50-397
License No. NPF-21

Mr. Mark E. Reddemann
Chief Executive Officer
Energy Northwest
MD 1023
P.O. Box 968
Richland, WA 99352

Comanche Peak Nuclear Power Plant
Luminant Generation Co., LLC
Docket Nos. 50-445 and 50-446
License Nos. NPF-87 and NPF-89

Mr. Rafael Flores
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Luminant Generation Company, LLC
Attn: Regulatory Affairs
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Glen Rose, TX 76043

Cooper Nuclear Station
Nebraska Public Power District
Docket No. 50-298
License No. DPR-46

Mr. Brian J. O'Grady
Vice President - Nuclear and Chief Nuclear Officer
Nebraska Public Power District
72676 648A Avenue
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Brownville, NE 68321

Crystal River Nuclear Generating Plant
Florida Power Corp.
Docket No. 50-302
License No. DPR-72

Mr. Jon A. Franke
Vice President
Attn: Supervisor, Licensing & Regulatory Affairs
Progress Energy, Inc.
Crystal River Nuclear Plant (NA2C)
15760 West Power Line Street
Crystal River, FL 34428-6708

Davis-Besse Nuclear Power Station
First Energy Nuclear Operating Co.
Docket No. 50-346
License No. NPF-3

Mr. Barry S. Allen
Site Vice President
FirstEnergy Nuclear Operating Company
c/o Davis-Besse NPS
5501 N. State Route 2
Oak Harbor, OH 43449-9760

Diablo Canyon Power Plant
Pacific Gas & Electric Co.
Docket Nos. 50-275 and 50-323
License Nos. DPR-80 and DPR-82

Mr. John T. Conway
Senior Vice President - Energy Supply and Chief Nuclear Officer
Pacific Gas and Electric Company
Diablo Canyon Power Plant
77 Beale Street, Mail Code B32
San Francisco, CA 94105

Donald C. Cook Nuclear Plant
Indiana Michigan Power Co.
Docket Nos. 50-315 and 50-316
License Nos. DPR-58 and DPR-74

Mr. Lawrence J. Weber
Senior Vice President and Chief Nuclear Officer
Indiana Michigan Power Company
Nuclear Generation Group
One Cook Place
Bridgman, MI 49106

Dresden Nuclear Power Station
Exelon Generation Co., LLC
Docket Nos. 50-237 and 50-249
License Nos. DPR-19 and DPR-25

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Exelon Nuclear
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Warrenville, IL 60555

Duane Arnold Energy Center
NextEra Energy Duane Arnold, LLC
Docket No. 50-331
License No. DPR-49

Mr. Peter Wells
Site Vice President
NextEra Energy
Duane Arnold Energy Center
3277 DAEC Road
Palo, IA 52324-9785

Edwin I. Hatch Nuclear Plant
Southern Nuclear Operating Co.
Docket Nos. 50-321 and 50-366
License Nos. DPR-57 and NPF-5

Mr. Dennis R. Madison
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Southern Nuclear Operating Company, Inc.
Edwin I. Hatch Nuclear Plant
11028 Hatch Parkway North
Baxley, GA 31513

Fermi
Detroit Edison Co.
Docket No. 50-341
License No. NPF-43

Mr. Jack M. Davis
Senior Vice President and Chief Nuclear Officer
Detroit Edison Company
Fermi 2 – 210 NOC
6400 North Dixie Highway
Newport, MI 48166

Fort Calhoun Station
Omaha Public Power District
Docket No. 50-285
License No. DPR-40

Mr. David J. Bannister
Vice President and Chief Nuclear Officer
Omaha Public Power District
444 South 16th St. Mall
Omaha, NE 68102-2247

Grand Gulf Nuclear Station
Entergy Operations, Inc.
Docket No. 50-416
License No. NPF-29

Mr. Michael Perito
Vice President, Operations
Entergy Operations, Inc.
Grand Gulf Nuclear Station, Unit 1
7003 Bald Hill Road
Port Gibson, MS 39150

H. B. Robinson Steam Electric Plant
Carolina Power & Light Co.
Docket No. 50-261
License No. DPR-23

Mr. Robert J. Duncan II
Vice President
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3581 West Entrance Road
Hartsville, SC 29550

Hope Creek Generating Station
PSEG Nuclear, LLC
Docket No. 50-354
License No. NPF-57

Mr. Thomas Joyce
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PSEG Nuclear LLC - N09
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Hancocks Bridge, NJ 08038

Indian Point Energy Center
Entergy Nuclear Operations, Inc.
Docket Nos. 50-247 and 50-286
License Nos. DPR-26 and DPR-64

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Entergy Nuclear Operations, Inc.
Indian Point Energy Center
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James A. FitzPatrick Nuclear Power Plant
Entergy Nuclear Operations, Inc.
Docket No. 50-333
License No. DPR-59

Mike Colomb
Vice President, Operations
Entergy Nuclear Operations, Inc.
James A. FitzPatrick Nuclear Power Plant
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Lycoming, NY 13093

Joseph M. Farley Nuclear Plant
Southern Nuclear Operating Co.
Docket Nos. 50-348 and 50-364
License Nos. NPF-2 and NPF-8

Mr. Tom Lynch
Vice President - Farley
Southern Nuclear Operating Company, Inc.
Joseph M. Farley Nuclear Plant
7388 North State Highway 95
Columbia, AL 36319

Kewaunee Power Station
Dominion Energy Kewaunee, Inc.
Docket No. 50-305
License No. DPR-43

Mr. David A. Heacock
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Dominion Energy Kewaunee, Inc.
Innsbrook Technical Center
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LaSalle County Station
Exelon Generation Co., LLC
Docket Nos. 50-373 and 50-374
License Nos. NPF-11 and NPF-18

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Limerick Generating Station
Exelon Generation Co., LLC
Docket Nos. 50-352 and 50-353
License Nos. NPF-39 and NPF-85

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Millstone Nuclear Power Station
Dominion Nuclear Connecticut, Inc.
Docket Nos. 50-336 and 50-423
License Nos. DPR-65 and NPF-49

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Monticello Nuclear Generating Plant
Northern States Power Company
Docket No. 50-263
License No. DPR-22

Mr. Timothy J. O'Connor
Site Vice President
Northern States Power Company - Minnesota
Monticello Nuclear Generating Plant
2807 West County Road 75
Monticello, MN 55362-9637

Nine Mile Point Nuclear Station
Nine Mile Point Nuclear Station, LLC
Docket Nos. 50-220 and 50-410
License Nos. DPR-63 and NPF-69

Mr. Ken Langdon
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Nine Mile Point Nuclear Station, LLC
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North Anna Power Station
Virginia Electric & Power Co.
Docket Nos. 50-338 and 50-339
License Nos. NPF-4 and NPF-7

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Oconee Nuclear Station
Duke Energy Carolinas, LLC
Docket Nos. 50-269, 50-270 and 50-287
License Nos. DPR-38, DPR-47 and DPR-55

Mr. Preston Gillespie
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Duke Energy Carolinas, LLC
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Oyster Creek Nuclear Generating Station
Exelon Generation Co., LLC
Docket No. 50-219
License No. DPR-16

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Palisades Nuclear Plant
Entergy Nuclear Operations, Inc.
Docket No. 50-255
License No. DPR-20

Mr. Anthony J. Vitale
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Entergy Nuclear Operations, Inc.
Palisades Nuclear Plant
27780 Blue Star Memorial Highway
Covert, MI 49043

Palo Verde Nuclear Generating Station
Arizona Public Service Company
Docket Nos. STN 50-528, STN 50-529 and STN 50-530
License Nos. NPF-41, NPF-51 and NPF-74

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Arizona Public Service Co.
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Phoenix, AZ 85072-2034

Peach Bottom Atomic Power Station
Exelon Generation Co., LLC
Docket Nos. 50-277 and 50-278
License Nos. DPR-44 and DPR-56

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Perry Nuclear Power Plant
First Energy Nuclear Operating Co.
Docket No. 50-440
License No. NPF-58

Mr. Vito A. Kaminskas
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FirstEnergy Nuclear Operating Company
Perry Nuclear Power Plant
10 Center Road, A290
Perry, OH 44081

Pilgrim Nuclear Power Station Unit No. 1
Entergy Nuclear Operations, Inc.
Docket No. 50-293
License No. DPR-35

Mr. Robert Smith
Vice President and Site Vice President
Entergy Nuclear Operations, Inc.
Pilgrim Nuclear Power Station
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Plymouth, MA 02360-5508

Point Beach Nuclear Plant
NextEra Energy Point Beach, LLC
Docket Nos. 50-266 and 50-301
License Nos. DPR-24 and DPR-27

Mr. Larry Meyer
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NextEra Energy Point Beach, LLC
Point Beach Nuclear Plant, Units 1 & 2
6610 Nuclear Road
Two Rivers, WI 54241-9516

Prairie Island Nuclear Generating Plant
Northern States Power Co. Minnesota
Docket Nos. 50-282 and 50-306
License Nos. DPR-42 and DPR-60

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Prairie Island Nuclear Generating Plant
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Welch, MN 55089-9642

Quad Cities Nuclear Power Station
Exelon Generation Co., LLC
Docket Nos. 50-254 and 50-265
License Nos. DPR-29 and DPR-30

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R. E. Ginna Nuclear Power Plant
R.E. Ginna Nuclear Power Plant, LLC
Docket No. 50-244
License No. DPR-18

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R.E. Ginna Nuclear Power Plant, LLC
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River Bend Station
Entergy Operations, Inc.
Docket No. 50-458
License No. NPF-47

Mr. Eric W. Olson
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Entergy Operations, Inc.
River Bend Station
5485 U.S. Highway 61N
St. Francisville, LA 70775

Salem Nuclear Generating Station
PSEG Nuclear, LLC
Docket Nos. 50-272 and 50-311
License Nos. DPR-70 and DPR-75

Mr. Thomas Joyce
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San Onofre Nuclear Generating Station
Southern California Edison Co.
Docket Nos. 50-361 and 50-362
License Nos. NPF-10 and NPF-15

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Southern California Edison Company
San Onofre Nuclear Generating Station
P. O. Box 128
San Clemente, CA 92674-0128

Seabrook
NextEra Energy Seabrook, LLC
Docket No. 50-443
License No. NPF-86

Mr. Paul Freeman
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c/o Mr. Michael O'Keefe
NextEra Energy Seabrook, LLC
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Seabrook, NH 03874

Sequoyah Nuclear Plant
Tennessee Valley Authority
Docket Nos. 50-327 and 50-328
License Nos. DPR-77 and DPR-79

Mr. Preston D. Swafford
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Shearon Harris Nuclear Power Plant
Carolina Power & Light Co.
Docket No. 50-400
License No. NPF-63

Mr. Christopher L. Burton
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Progress Energy Carolinas, Inc.
Shearon Harris Nuclear Power Plant
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South Texas Project
STP Nuclear Operating Co.
Docket Nos. 50-498 and 50-499
License Nos. NPF-76 and NPF-80

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STP Nuclear Operating Company
South Texas Project
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Wadsworth, TX 77483

St. Lucie Plant
Florida Power & Light Co.
Docket Nos. 50-335 and 50-389
License Nos. DPR-67 and NPF-16

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Surry Power Station
Virginia Electric & Power Co.
Docket Nos. 50-280 and 50-281
License Nos. DPR-32 and DPR-37

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Susquehanna Steam Electric Station
PPL Susquehanna, LLC
Docket Nos. 50-387 and 50-388
License Nos. NPF-14 and NPF-22

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PPL Susquehanna, LLC
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Berwick, PA 18603-0467

Turkey Point
Florida Power & Light Co.
Docket Nos. 50-250 and 50-251
License Nos. DPR-31 and DPR-41

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Vermont Yankee Nuclear Power Station
Entergy Nuclear Operations, Inc.
Docket No. 50-271
License No. DPR-28

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Vermont Yankee Nuclear Power Station
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Virgil C. Summer Nuclear Station
South Carolina Electric & Gas Co.
Docket No. 50-395
License No. NPF-12

Mr. Thomas D. Gatlin
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South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station
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Jenkinsville, SC 29065

Vogtle Electric Generating Plant
Southern Nuclear Operating Co.
Docket Nos. 50-424 and 50-425
License Nos. NPF-68 and NPF-81

Mr. Tom E. Tynan
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Southern Nuclear Operating Company, Inc.
Vogtle Electric Generating Plant
7821 River Road
Waynesboro, GA 30830

Vogtle Electric Generating Plant, Units 3 and 4
Southern Nuclear Operating Co.
Docket Nos. 52-025 and 52-026
License Nos. NPF-91 and NPF-92

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Birmingham, AL 35242

Waterford Steam Electric Station
Entergy Operations, Inc.
Docket No. 50-382
License No. NPF-38

Ms. Donna Jacobs
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Entergy Operations, Inc.
Waterford Steam Electric Station, Unit 3
17265 River Road
Killona, LA 70057-0751

Watts Bar Nuclear Plant, Unit 1
Tennessee Valley Authority
Docket No. 50-390
License No. NPF-90

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1101 Market Street
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Watts Bar Nuclear Plant, Unit 2
Tennessee Valley Authority
Docket No. 50-391
Construction Permit No. CPPR No. 092

Mr. Michael D. Skaggs
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Tennessee Valley Authority
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1101 Market Street
Chattanooga, TN 37402-2801

William B. McGuire Nuclear Station
Duke Energy Carolinas, LLC
Docket Nos. 50-369 and 50-370
License Nos. NPF-9 and NPF-17

Mr. Regis T. Repko
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Duke Energy Carolinas, LLC
McGuire Nuclear Site
12700 Hagers Ferry Road
Huntersville, NC 28078

Wolf Creek Generating Station
Wolf Creek Nuclear Operating Corp.
Docket No. 50-482
License No. NPF-42

Mr. Matthew W. Sunseri
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REQUIREMENTS FOR RELIABLE SPENT FUEL POOL LEVEL INSTRUMENTATION AT OPERATING REACTOR SITES AND CONSTRUCTION PERMIT HOLDERS

All licensees identified in Attachment 1 to this Order shall have a reliable indication of the water level in associated spent fuel storage pools capable of supporting identification of the following pool water level conditions by trained personnel: (1) level that is adequate to support operation of the normal fuel pool cooling system, (2) level that is adequate to provide substantial radiation shielding for a person standing on the spent fuel pool operating deck, and (3) level where fuel remains covered and actions to implement make-up water addition should no longer be deferred.

1. The spent fuel pool level instrumentation shall include the following design features:

   1.1 Instruments: The instrumentation shall consist of a permanent, fixed primary instrument channel and a backup instrument channel. The backup instrument channel may be fixed or portable. Portable instruments shall have capabilities that enhance the ability of trained personnel to monitor spent fuel pool water level under conditions that restrict direct personnel access to the pool, such as partial structural damage, high radiation levels, or heat and humidity from a boiling pool.

   1.2 Arrangement: The spent fuel pool level instrument channels shall be arranged in a manner that provides reasonable protection of the level indication function against missiles that may result from damage to the structure over the spent fuel pool. This protection may be provided by locating the primary instrument channel and fixed portions of the backup instrument channel, if applicable, to maintain instrument channel separation within the spent fuel pool area, and to utilize inherent shielding from missiles provided by existing recesses and corners in the spent fuel pool structure.

   1.3 Mounting: Installed instrument channel equipment within the spent fuel pool shall be mounted to retain its design configuration during and following the maximum seismic ground motion considered in the design of the spent fuel pool structure.

   1.4 Qualification: The primary and backup instrument channels shall be reliable at temperature, humidity, and radiation levels consistent with the spent fuel pool water at saturation conditions for an extended period. This reliability shall be established through use of an augmented quality assurance process (e.g., a process similar to that applied to the site fire protection program).

   1.5 Independence: The primary instrument channel shall be independent of the backup instrument channel.

   1.6 Power supplies: Permanently installed instrumentation channels shall each be powered by a separate power supply. Permanently installed and portable instrumentation channels shall provide for power connections from sources independent of the plant ac and dc power distribution systems, such as portable generators or replaceable batteries. Onsite generators used as an alternate power source and replaceable batteries used for instrument channel power shall have sufficient capacity to maintain the level indication function until offsite resource availability is reasonably assured.

1.7 Accuracy: The instrument channels shall maintain their designed accuracy following a power interruption or change in power source without recalibration.

1.8 Testing: The instrument channel design shall provide for routine testing and calibration.

1.9 Display: Trained personnel shall be able to monitor the spent fuel pool water level from the control room, alternate shutdown panel, or other appropriate and accessible location. The display shall provide on-demand or continuous indication of spent fuel pool water level.

2. The spent fuel pool instrumentation shall be maintained available and reliable through appropriate development and implementation of the following programs:

2.1 Training: Personnel shall be trained in the use and the provision of alternate power to the primary and backup instrument channels.

2.2 Procedures: Procedures shall be established and maintained for the testing, calibration, and use of the primary and backup spent fuel pool instrument channels.

2.3 Testing and Calibration: Processes shall be established and maintained for scheduling and implementing necessary testing and calibration of the primary and backup spent fuel pool level instrument channels to maintain the instrument channels at the design accuracy.

REQUIREMENTS FOR RELIABLE SPENT FUEL POOL LEVEL
INSTRUMENTATION AT COMBINED LICENSE HOLDER REACTOR SITES

Attachment 2 to this Order for Part 50 Licensees requires reliable indication of the water level in associated spent fuel storage pools capable of supporting identification of the following pool water level conditions by trained personnel: (1) level that is adequate to support operation of the normal fuel pool cooling system, (2) level that is adequate to provide substantial radiation shielding for a person standing on the spent fuel pool operating deck, and (3) level where fuel remains covered and actions to implement make-up water addition should no longer be deferred.

The design bases of Vogtle Units 3 and 4 address many of these attributes of spent fuel pool level instrumentation. The NRC staff reviewed these design features prior to issuance of the combined licenses for these facilities and certification of the AP1000 design referenced therein. The AP1000 certified design largely addresses the requirements in Attachment 2 by providing two safety-related spent fuel pool level instrument channels. The instruments measure level from the top of the spent fuel pool to the top of the fuel racks to address the range requirements listed above. The safety-related classification provides for the following additional design features:

- Seismic and environmental qualification of the instruments
- Independent power supplies
- Electrical isolation and physical separation between instrument channels
- Display in the control room as part of the post-accident monitoring instrumentation
- Routine calibration and testing

As such, this Order requires Vogtle Units 3 and 4 to address the following requirements that were not specified in the certified design.

1. The spent fuel pool level instrumentation shall include the following design features:

    1.1 Arrangement: The spent fuel pool level instrument channels shall be arranged in a manner that provides reasonable protection of the level indication function against missiles that may result from damage to the structure over the spent fuel pool. This protection may be provided by locating the safety-related instruments to maintain instrument channel separation within the spent fuel pool area, and to utilize inherent shielding from missiles provided by existing recesses and corners in the spent fuel pool structure.

    1.2 Qualification: The level instrument channels shall be reliable at temperature, humidity, and radiation levels consistent with the spent fuel pool water at saturation conditions for an extended period.

    1.3 Power supplies: Instrumentation channels shall provide for power connections from sources independent of the plant alternating current (ac) and direct current (dc) power distribution systems, such as portable generators or replaceable batteries. Power supply designs should provide for quick and accessible connection of sources independent of the plant ac and dc power distribution systems. Onsite generators used as an alternate power source and replaceable batteries used for instrument channel power shall have sufficient capacity to maintain the level indication function until offsite resource availability is reasonably assured.

1.4 Accuracy: The instrument shall maintain its designed accuracy following a power interruption or change in power source without recalibration.

1.5 Display: The display shall provide on-demand or continuous indication of spent fuel pool water level.

2. The spent fuel pool instrumentation shall be maintained available and reliable through appropriate development and implementation of a training program. Personnel shall be trained in the use and the provision of alternate power to the safety-related level instrument channels.

Pursuant to Section 223 of the Atomic Energy Act of 1954, as amended, any person who willfully violates, attempts to violate, or conspires to violate, any provision of this Order shall be subject to criminal prosecution as set forth in that section. Violation of this order may also subject the person to civil monetary penalty.

The enclosed Order requires responses and actions within specified timeframes. Please contact your Licensing Project Manager or Mrs. Lisa Regner, Spent Fuel Pool Instrumentation Order Project Manager (301-415-1906), regarding any issues related to compliance with the requirements in the enclosed Order, or if you have other questions.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. The NRC also includes significant enforcement actions on its Web site at (http://www.nrc.gov/reading-rm/doc-collections/enforcement/actions/. The enclosed Order has been forwarded to the Office of the *Federal Register* for publication.

Sincerely,

***/ra/***
Eric J. Leeds, Director
Office of Nuclear Reactor Regulation

***/ra/***
Michael R. Johnson, Director

Enclosure:
Order (EA-12-051)

cc: Listserv

Distribution: See next page

**ADAMS Accession No.:** ML12054A682 (package) *e-mail concurrence

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| **DATE** | 03/09/2012 | 03/12/2012 | 02/05/2012 | 03/11/2012 | 03/10/2012 |
| **OFFICE** | OE* | D: JLD* | OD: NRO | OD: NRR | |
| **NAME** | RZimmerman (NHilton for) | DSkeen | MJohnson | ELeeds | |
| **DATE** | 03/09/2012 | 03/11/2012 | 03/ 12 /2012 | 03/ 12 /2012 | |

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 29, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Nuclear Connecticut, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION, UNIT NO. 2 – REQUEST FOR ADDITIONAL INFORMATION REGARDING STEAM GENERATOR TUBE INSERVICE INSPECTION REPORT FOR END OF CYCLE 20 (TAC NO. ME7352)

Dear Mr. Heacock:

By letter dated October 7, 2011 (Agencywide Documents Access and Management System Accession No. ML11291A059), Dominion Nuclear Connecticut, Inc. (the licensee), submitted information summarizing the results of the end of cycle 20 steam generator tube inspections at Millstone Power Station, Unit No. 2. The U.S. Nuclear Regulatory Commission staff has reviewed the information provided by the licensee and has determined that the enclosed additional information is needed in order to complete the review.

The draft questions were sent to Ms. Wanda Craft, of your staff, to ensure that the questions were understandable, the regulatory basis for the questions was clear, and to determine if the information was previously docketed. On March 15, 2012, Ms. Craft agreed that you would provide a response by May 17, 2012.

If you have any questions regarding this matter, please contact me at 301-415-1603.

Sincerely,

Carleen J. Sanders, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-336

Enclosure:
As stated

cc w/encl: Distribution via Listserv

OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR ADDITIONAL INFORMATION

STEAM GENERATOR TUBE INSERVICE INSPECTION

REPORT FOR END OF CYCLE 20

MILLSTONE POWER STATION, UNIT NO. 2

DOCKET NUMBER 50-336

By letter dated October 7, 2011 (Agencywide Documents Access and Management System Accession No. ML11291A059), Dominion Nuclear Connecticut, Inc. (the licensee), submitted information summarizing the results of the end of cycle 20 steam generator (SG) tube inspections at Millstone Power Station, Unit No. 2. The U.S. Nuclear Regulatory Commission staff has reviewed the information provided by the licensee and has determined that the following additional information is needed in order to complete the review:

1. There were a number of indications reported in Table 3 of the October 7, 2011, submittal that appear to be in the free span region and are classified as foreign object wear. Please discuss the basis for concluding that the indications were the result of foreign object wear (e.g., visual inspection confirming a wear scar).

2. Please discuss the results of the secondary side inspections and channel head inspections.

3. There were a number of newly reported dents and dings on both the hot-leg and cold-leg of both SGs. Please discuss the nature of these new dents and dings and what may have caused them.

Enclosure

March 29, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Nuclear Connecticut, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION, UNIT NO. 2 – REQUEST FOR ADDITIONAL INFORMATION REGARDING STEAM GENERATOR TUBE INSERVICE INSPECTION REPORT FOR END OF CYCLE 20 (TAC No. ME7352)

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Sincerely,

*/ra/*
Carleen J. Sanders, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-336

Enclosure:
As stated

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| NAME | CSanders | ABaxter | GKulesa | MKhanna | CSanders |
| DATE | 3/21/12 | 3/21/12 | 3/27/12 | 3/27 /12 | 3/27 /12 |

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**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
**REGION I**
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

March 27, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Resources
5000 Dominion Blvd.
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION
NRC EMERGENCY PREPAREDNESS ANNUAL INSPECTION REPORT
NOS. 05000336/2011501 AND 05000423/2011501

Dear Mr. Heacock:

On December 31, 2011, the NRC staff completed its annual inspection of the Emergency Preparedness Program at Millstone Power Station. This inspection began on January 1, 2011. Issuance of this letter closes Inspection Reports 05000336/2011501 and 05000423/2011501. Inspection activities charged to these reports include conducting mid-cycle/end of cycle assessment activities, responding to technical questions from resident inspectors or licensee personnel, and resident baseline inspection. Any observations and findings in this area were provided to you via separate correspondence.

In accordance with 10 CFR 2.390 of the NRC's Rules of Practice, a copy of this letter, and your response, if any, will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

James M. Trapp, Chief
Plant Support Branch 1
Division of Reactor Safety

Docket Nos. 50-336, 50-423
License Nos. DPR-65, NPF-49

cc: Distribution via ListServ

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Resources
5000 Dominion Blvd.
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION
NRC EMERGENCY PREPAREDNESS ANNUAL INSPECTION REPORT
NOS. 05000336/2011501 AND 05000423/2011501

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Sincerely,

***/RA/***

James M. Trapp, Chief
Plant Support Branch 1
Division of Reactor Safety

Docket Nos. 50-336, 50-423
License Nos. DPR-65, NPF-49

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DOCUMENT NAME: G:\DRS\Plant Support Branch 1\Crisden\2012 EP_Security Closeout Letters\MillstoneCloseout2011rev1.docx
ADAMS ACCESSION NUMBER: ML12087A268

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|---|---|---|---|---|---|
| OFFICE | RI/DRS | RI/DRP | RI/DRS | | |
| NAME | CCrisden | RBellamy | JTrapp | | |
| DATE | 3/8/12 | 3/9/12 | 3/13/12 | | |

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cc:
P. Baumann, Security Manager, Millstone Station
E. Wilds, Jr., Ph.D., Director, State of Connecticut SLO
J. Hauer, Commissioner, NY State Div. of Homeland Security and Emergency Services
F. Murray, President & CEO, NY State Energy Research and Development Authority
S. Colman, RAC Chair, FEMA Region I

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**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
**REGION I**
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

April 23, 2012

Mr. David Heacock
President and Chief Nuclear Officer
Dominion Resources
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION – NRC INTEGRATED INSPECTION REPORT 05000336/2012002 AND 05000423/2012002

Dear Mr. Heacock:

On March 31, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Millstone Power Station, Units 2 and 3. The enclosed inspection report documents the inspection results, which were discussed on April 19, 2012 with Mr. Stephen E. Scace, Site Vice President, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

No NRC-identified or self-revealing findings were identified during this inspection.

In accordance with 10 CFR 2.390 of the NRCs "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the

NRC's document system (ADAMS). ADAMS is accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Ronald R. Bellamy, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Docket Nos.: 50-336, 50-423
License Nos.: DRP-65, NPF-49

Enclosure: Inspection Report 05000336/2012002 and 05000423/2012002
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

NRC's document system (ADAMS). ADAMS is accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Ronald R. Bellamy, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Docket Nos.: 50-336, 50-423
License Nos.: DRP-65, NPF-49

Enclosure: Inspection Report 05000336/2012002 and 05000423/2012002
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

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DOCUMENT NAME: G:\DRP\BRANCH5\Reports\Final\MillstoneIR1202.docx
ADAMS ACCESSION NUMBER: **ML12114A204**

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| OFFICE | RI/DRP | RI/DRP | RI/DRP | | |
| NAME | SShaffer/via email | TSetzer | RBellamy | | |
| DATE | 04/23/12 | 04/23/12 | 04/23/12 | | |

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

| | |
|---|---|
| Docket Nos.: | 50-336, 50-423 |
| License Nos.: | DPR-65, NPF-49 |
| Report No.: | 05000336/2012002 and 05000423/2012002 |
| Licensee: | Dominion Nuclear Connecticut, Inc. |
| Facility: | Millstone Power Station, Units 2 and 3 |
| Location: | P.O. Box 128<br>Waterford, CT 06385 |
| Dates: | January 1, 2012 through March 31, 2012 |
| Inspectors: | S. Shaffer, Senior Resident Inspector, Division of Reactor Projects (DRP)<br>J. Krafty, Resident Inspector, DRP<br>B. Haagensen, Resident Inspector, DRP<br>E. Burket, Reactor Inspector, Division of Reactor Safety (DRS)<br>F. Arner, Senior Reactor Inspector, DRS<br>J. Brand, Reactor Inspector, DRS<br>J. Furia, Senior Health Physicist, DRS |
| Approved By: | Ronald R. Bellamy, Chief<br>Reactor Projects Branch 5<br>Division of Reactor Projects |

## TABLE OF CONTENTS

## SUMMARY OF FINDINGS

IR 05000336/2012002, 05000423/2012002; 1/1/2012-3/31/2012; Millstone Units 2 and 3; Routine Quarterly Integrated Report

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. No findings or violations were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

## REPORT DETAILS

Summary of Plant Status

Millstone Unit 2 and Unit 3 began the inspection period operating at 100 percent power. On January 13, both units reduced power because of storm related fouling of the intake structure. Unit 2 reduced power to 73 percent at 8:45 p.m. and resumed 100 percent power operations at 10:00 p.m. on January 14. Unit 3 reduced power to 80 percent at 8:20 p.m. on January 13 and resumed 100 percent power operations at 5:18 PM on January 14. On January 20, Unit 2 reduced power to 83 percent at 12:00 a.m. to replace seals on the 'B' and 'C' condensate pumps. On January 23, Unit 2 resumed 100 percent power operations at 2:43 a.m. On February 25, Unit 3 reduced power to 75 percent due to environmental factors affecting plant conditions. Unit 3 resumed to 100 percent power operations on February 27.

### 1. REACTOR SAFETY

**Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**

1R04 Equipment Alignment

Partial System Walkdowns (71111.04Q – 3 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

Unit 2

- 'B' Control Room Air Conditioning System (CRAC) while the 'A' CRAC was out of service (OOS) for repairs on March 21
- 'A' Emergency Diesel Generator (EDG) while the 'B' EDG was OOS for surveillance testing on March 28

Unit 3

- Station Blackout (SBO) Diesel on March 30

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the Updated Final Safety Analysis Report (UFSAR), technical specifications (TS), work orders, condition reports (CR), and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted system performance of their intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether Dominion staff had properly identified equipment issues and entered them into their corrective action program (CAP) for resolution with the appropriate significance characterization. Documents reviewed for each section of this inspection report are listed in the Attachment.

b. Findings

No findings were identified.

1R05 Fire Protection

Resident Inspector Quarterly Walkdowns (71111.05Q – 3 samples)

a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that Dominion controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in the area pre-fire plan, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for out of service, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

Unit 2

- 'B' EDG Compartment, Fire Area A-16
- East DC Switchgear Room, Fire Area A-20

Unit 3

- SBO Diesel and Tank Enclosure, Fire Area SBO-1

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11 – 3 samples)

.1 Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed a licensed operator simulator training for Unit 2 on January 10, which included letdown controller malfunction followed by flooding in the turbine building and a rupture of the auxiliary feed water pump discharge piping. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the TS action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

The inspectors observed licensed operator simulator training for Unit 3 on January 17, which included a loss of condenser vacuum followed by a small break loss of coolant accident. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the technical specification action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

.2 Quarterly Review of Licensed Operator Performance in the Main Control Room

a. Inspection Scope

The inspectors observed and reviewed the crew's preparations for a potential TS shutdown due to inoperable Unit 3 Steam Generator (SG) pressure transmitters during the evening of February 9 and turbine valve testing on February 17. The inspectors observed infrequently performed tests or evolution briefings, pre-shift briefings, and reactivity control briefings to verify that the briefings met the criteria specified in Dominion's Operations Section Expectations Handbook and Dominion's Administrative Procedure OP-AA-329, "Conduct of Infrequently Performed Tests and Evolutions," Revision 1. Additionally, the inspectors observed test performance to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12 – 4 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structures, systems, and components (SSC) performance and reliability. The inspectors reviewed system health reports, CAP documents, maintenance work orders, and maintenance rule basis documents to ensure that Dominion was identifying and properly evaluating performance problems within the scope of the maintenance rule. For each sample selected, the inspectors verified that the SSC was properly scoped into the maintenance rule in accordance with 10 CFR 50.65 and verified that the (a)(2) performance criteria established by Dominion staff was reasonable. As applicable, for SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a)(2). Additionally,

the inspectors ensured that Dominion staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

Unit 2

- Main Feedwater System
- Radiation Monitoring System

Unit 3

- Auxiliary Feedwater System
- 480 VAC Motor Control Center Breakers

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 6 samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that Dominion performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that Dominion personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When Dominion performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the TS requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

Unit 2

- Moderate Trip Risk due to maintenance on 345 KV Line 310 which removed Unit 2's output tie to the North Bus on January 9
- Yellow Risk due to the 'A' high pressure safety injection (HPSI) pump being out for testing on January 19
- Increased Trip Risk due to 'B' condensate pump being taken OOS for repair immediately followed by a similar repair on the 'C' condensate pump starting on January 20 and finishing on January 23
- Increased Trip Risk due to 'A' stator cooling pump being replaced on February 7

Unit 3

- Unplanned loss of the 'A' EDG during surveillance testing with the 'A' HPSI pump, 'B' RPCCW pump, and 'A' TBCCW pump OOS on January 18

- Extended maintenance period due to frequency fluctuation on the 'A' EDG during Preventive Maintenance Test (PMT) surveillance on February 21

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 6 samples)

a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions:

Unit 2

- CR457554, Terry Turbine HELB door not fully contacting the knife edge
- CR459124, 'B' condensate pump elevated mechanical seal leakage and its associated Operational Decision Making (ODM)
- CR460065, 'A' reactor coolant pump (RCP) motor oil leakage and its associated ODM

Unit 3

- OD000468, 'A' EDG Governor Load Swings
- CR464272, Rosemount Transmitter Part 21
- CR464818, Ground Water Intrusion through ESF Cable Penetrations

The inspectors selected these issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the operability determinations to assess whether TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TS and UFSAR to Dominion's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled by Dominion. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 2 samples)

.1 Temporary Modifications

a. Inspection Scope

The inspectors reviewed a temporary modification to the Unit 3 'D' SG level transmitter low level setpoint described in Temp Mod 3-12-005, "3FWS*LB547B 'D' SG Level Setpoint Change" to determine whether the modification affected the safety functions of systems that are important to safety. The inspectors reviewed 10 CFR 50.59 documentation and post-modification testing results to verify that the temporary modifications did not degrade the design bases, licensing bases, and performance capability of the affected systems.

b. Findings

No findings were identified.

.2 Permanent Modifications

a. Inspection Scope

The inspectors evaluated a modification to the Unit 2 Refueling Water Storage Tank (RWST) remote temperature sensor implemented by design modification package DM2-00-0253-09, "Unit 2 RWST RTD Modification." The inspectors reviewed the 10 CFR 50.59 justification and verified that the design bases, licensing bases, TS and performance capability of the affected systems were not degraded by the modification. In addition, the inspectors reviewed modification design documents associated with the design change for the replacement of the RTD temperature sensor with a modified, flexible RTD and walked down the proposed field installation site.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 7 samples)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed the test procedure to verify that the procedure adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure were consistent with the information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed the test or reviewed test data to verify that the test results adequately demonstrated restoration of the affected safety functions.

Unit 2

- Post Maintenance Test for 'A' stator cooling pump following a motor replacement on February 8
- Post Maintenance Test for 'A' EDG following channel head replacement of the diesel jacket water heat exchanger on February 15

Unit 3

- Post Maintenance Test for the 'A' EDG following routine maintenance and failed fuse replacement on February 21
- 'C' Condensate Pump following replacement on March 3
- Post Maintenance Test for the 'A' EDG sequencer following replacement of the 15 volt and 48 volt power supplies on March 2
- Post Maintenance Test for the 'A' EDG sequencer following the second replacement of the 48 volt power supplies on March 24
- Post Maintenance Test for the TDAFW Pump Governor Speed Setting Issue on March 26

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 7 samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs to assess whether test results satisfied TS, the UFSAR, and Dominion procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

Unit 2

- SP 2613L, "Diesel Generator Slow Start Operability Test, Facility 2," Revision 005-01
- SP 2602A, "Reactor Coolant Leakage," Revision 006-02 (RCS Leakage)
- SP 2610BO-005, "TDAFP Operational Test form C-10," Revision 000-00
- SP 2613N, "'A' EDG Operability Tests, SIAS Start, Facility 2," Revision 001-05
- CP 2802N, "Primary Systems Sampling and Analysis," Revision 001-03

Unit 3

- CP 3802E, "Reactor Coolant Gas Sampling and Analysis," Revision 002-01
- SP 3601F.6, "Reactor Coolant System, Water Inventory Measurement," Revision 006-06

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness**

1EP6 Drill Evaluation (71114.06 – 1 sample)

Training Observations

a. Inspection Scope

The inspectors observed a simulator training evolution for Unit 3 licensed operators on January 17, which required emergency plan implementation by an operations crew. Dominion planned for this evolution to be evaluated and included in performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crew. The inspectors also attended the post-evolution critique for the scenario. The focus of the inspector's activities was to note any weaknesses and deficiencies in the crew's performance and ensure that Dominion evaluators noted the same issues and entered them into their CAP.

b. Findings

No findings were identified.

## 2. RADIATION SAFETY

**Cornerstone: Public and Occupational Radiation Safety**

2RS01 Radiological Hazard Assessment and Exposure Controls (71124.01)

a. Inspection Scope

The inspectors performed walk downs of the Dominion facility, including radioactive waste processing, storage, and handling areas to evaluate material conditions and potential radiological conditions.

The inspectors selected containers holding non-exempt licensed radioactive materials that may cause unplanned or inadvertent exposure of workers, and verified that they were labeled and controlled.

During tours of the facility and review of ongoing work the inspectors evaluated ambient radiological conditions. The inspectors verified that existing conditions were consistent with posted surveys, radiation work permits (RWP), and worker briefings, as applicable.

The inspectors verified that radiation monitoring devices were placed on the individual's body consistent with the method that Dominion was employing to monitor dose from external radiation sources. The inspectors verified that the dosimeter was placed in the

location of highest expected dose or that Dominion was properly employing an NRC-approved method of determining effective dose equivalent.

For high-radiation work areas with significant dose rate gradients (a factor of 5 or more), the inspectors reviewed the application of dosimetry to effectively monitor exposure to personnel. The inspectors verified that Dominion controls were adequate.

The inspectors verified that problems associated with radiation monitoring and exposure control were being identified by Dominion at an appropriate threshold and were properly addressed for resolution in their CAP. In addition, the inspectors verified the appropriateness of the corrective actions for a selected sample of problems documented by Dominion that involve radiation monitoring and exposure controls. The inspectors determined that Dominion was assessing the applicability of operating experience to their plants.

b. Findings

No findings were identified.

2RS02 Occupational ALARA Planning and Controls (71124.02)

a. Inspection Scope

The inspectors obtained from Dominion a list of work activities ranked by actual or estimated exposure that occurred during the last outage (3R14), and selected work activities of the highest exposure significance.

The inspectors reviewed the as low as reasonably achievable (ALARA) work activity evaluations, exposure estimates, and exposure mitigation requirements. The inspectors determined that Dominion had reasonably grouped the radiological work into work activities, based on historical precedence, industry norms, and/or special circumstances.

The inspectors verified that Dominion's planning identified appropriate dose mitigation features considered alternate mitigation features commensurate with the risk of the work activity and defined reasonable dose goals. The inspectors verified that Dominion's ALARA assessment had taken into account decreased worker efficiency from use of respiratory protective devices and or heat stress mitigation equipment. The inspectors determined that Dominion's work planning considered the use of remote technologies as a means to reduce dose and the use of dose reduction insights from industry operating experience and plant-specific lessons learned. The inspectors verified the integration of ALARA requirements into work procedure and radiation work permit (RWP) documents.

The inspectors compared the results achieved with the intended dose established in Dominion's ALARA planning for these work activities. The inspectors compared the person-hour estimates provided by maintenance planning and other groups with the actual work activity performance, and evaluated the accuracy of these time estimates. The inspectors determined the reasons for any inconsistencies between intended and actual work activity doses. The inspectors focused on those work activities with planned or accrued exposure greater than 5 person-rem (Boric Acid Corrosion Control Program, insulation, mechanical maintenance, reactor disassembly/reassembly, scaffolding, SG work, and valve repairs).

The inspectors determined that post-job reviews were conducted and all issues identified were entered into Dominion's CAP.

The inspectors evaluated Dominion's method of adjusting exposure estimates, or re-planning work, when unexpected changes in scope or emergent work were encountered. The inspectors determined that adjustments to exposure estimates were based on sound radiation protection and ALARA principles. The inspectors determined whether the frequency of these adjustments question the adequacy of the original ALARA planning process.

The inspectors verified that issues associated with ALARA planning and controls were being identified by Dominion at an appropriate threshold and were properly addressed for resolution in their CAP.

b. Findings

No findings were identified.

2RS04 Occupational Dose Assessment (71124.04)

a. Inspection Scope

The inspectors reviewed the most recent National Voluntary Laboratory Accreditation Program (NVLAP) accreditation report pertaining to Dominion's dosimetry program.

The inspectors reviewed Dominion procedures associated with dosimetry operations, including issuance/use of external dosimetry, assessment of internal dose, and evaluation of dose assessment for radiological incidents.

The inspectors verified that Dominion had established procedural requirements for determining when external and internal dosimetry was required.

The inspectors verified that Dominion's personnel dosimeters that require processing were NVLAP accredited. The inspectors verified the vendor's NVLAP accreditation. The inspectors ensured that the approved irradiation test categories for each type of personnel dosimeter used were consistent with the types and energies of the radiation present, and the way that the dosimeter was being used.

The inspectors selected dosimetry occurrence reports or CAP documents for adverse trends related to electronic dosimeters. The inspectors determined that Dominion had not identified any trends and where appropriate, implemented appropriate corrective actions.

The inspectors reviewed procedures used to assess dose from internally deposited nuclides using whole body counting equipment. The inspectors verified that the procedures addressed methods for determining if an individual was internally or externally contaminated, the release of contaminated individuals, the determination of entry route, and assignment of dose.

The inspectors verified that the frequency of such measurements was consistent with the biological half-life of the potential radionuclides available for intake.

The inspectors evaluated the minimum detectable activity (MDA) of instrument. The inspectors determined that the MDA were adequate to determine the potential for internally deposited radionuclides sufficient to prompt additional investigation.

The inspectors verified that the system used in each bioassay had sufficient counting time/low background to ensure appropriate sensitivity for the potential radionuclides of interest. The inspectors verified that the appropriate radionuclide library was used. The inspectors verified that any anomalous count peaks indicated in each output spectra received appropriate disposition.

The inspectors reviewed the counting laboratory's QA program and verified that if a vendor lab is used, Dominion audits of the lab were conducted. The inspectors verified that the lab participated in an analysis cross-check program and that out-of-tolerance results were evaluated and resolved appropriately.

The inspectors reviewed Dominion's methodology for monitoring external dose in situations where non-uniform fields are expected or large dose gradients exist. The inspectors verified that Dominion had established criteria for determining when alternate monitoring techniques were to be implemented.

The inspectors reviewed dose assessments performed using multi-badging during the current assessment period. The inspectors verified that the assessments were performed consistently with Dominion procedures and dosimetric standards.

The inspectors evaluated Dominion's neutron dosimetry program, including dosimeter type(s) and/or survey instrumentation.

The inspectors verified that problems associated with occupational dose assessment were being identified by Dominion at an appropriate threshold and were properly addressed for resolution in their CAP. In addition, the inspectors verified the appropriateness of the corrective actions for a selected sample of issues documented by Dominion.

b. Findings

No findings were identified.

## 4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151- 4 samples)

Reactor Coolant System (RCS) Specific Activity and RCS Leak Rate

a. Inspection Scope

The inspectors reviewed Dominion's submittal for the RCS specific activity and RCS leak rate performance indicators for both Unit 2 and Unit 3 for the period of January 1, 2011 through December 31, 2011. To determine the accuracy of the performance indicator

data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors also reviewed RCS sample analysis and control room logs of daily measurements for RCS leakage, and compared that information to the data reported by the performance indicator. Additionally, the inspectors observed surveillance activities that determined the RCS identified leakage rate, and chemistry personnel taking and analyzing a RCS sample.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152)

Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that Dominion entered issues into the CAP at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP.

b. Findings

No findings were identified.

4OA5 Other Activities

(Closed) NRC Temporary Instruction 2515/177 - Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal and Containment Spray Systems

a. Inspection Scope

The inspectors performed the inspection at Units 2 and 3 in accordance with Temporary Instruction (TI) 2515/177, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal and Containment Spray Systems." The NRC developed TI 2515/177 to support the NRC's confirmatory review of Dominion's responses to NRC Generic Letter (GL) 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal and Containment Spray Systems." Based on a review of Dominion's GL 2008-01 response letters, the NRC Office of Nuclear Reactor Regulation (NRR) staff provided additional plant specific guidance on inspection scope to the regional inspectors. The inspectors used this inspection guidance along with the TI to verify that Dominion implemented or was in the process of acceptably implementing the commitments, modifications, and programmatically controlled actions described in their GL 2008-01 response. The inspectors verified that the plant-specific information (including licensing basis documents and design information) was consistent with the information that Dominion submitted to the NRC in response to GL 2008-01.

The inspectors reviewed a sample of isometric drawings, and piping and instrumentation diagrams, and conducted selected system piping walkdowns to verify that Dominion's drawings reflected the subject system configurations and UFSAR descriptions. Specifically, the inspectors verified the following related to a sample of isometric drawings for the safety injection (SI), containment spray, and shutdown cooling systems for Unit 2 and the SI, residual heat removal system, quench spray system, and containment recirculation spray system for Unit 3.

- High point vents were identified
- High points that did not have vents were recognized and evaluated with respect to their potential for gas buildup
- Other areas where gas could accumulate and potentially impact subject system operability, such as orifices in horizontal pipes, isolated branch lines, heat exchangers, improperly sloped piping, and under closed valves, were acceptably evaluated in engineering reviews or had ultrasonic test (UT) points which would reasonably detect void formation
- For piping segments reviewed, branch lines and fittings were clearly shown

The inspectors performed walkdowns of portions of the above systems to evaluate the acceptability of Dominion's drawings utilized during their review of GL 2008-01. The inspectors verified that Dominion performed walkdowns of the applicable systems to confirm that the combination of system orientation, vents, instructions and procedures, testing, and training, would ensure that each system was sufficiently full of water to ensure operability. The inspectors reviewed Dominion's methodology used to determine system piping high points, identification of negative sloped piping, and calculations of void sizes based on UT equipment readings, to ensure the methods were reasonable. The inspectors also reviewed engineering analyses associated with the development of acceptance criteria for as-found voids. The review included engineering assumptions for void transport and acceptability of void fractions at the suction and discharge piping of the applicable system pumps. In addition, the inspectors verified that Dominion included all emergency core cooling systems, along with supporting systems, within the scope of the GL. The inspectors also observed several field UT measurements of the applicable piping in Unit 3 to assess the adequacy of the monitoring techniques used to ensure system operability.

The inspectors reviewed a sample of Dominion's procedures used for filling and venting the systems associated with GL 2008-01 to verify that the procedures were effective in venting or reducing voiding to acceptable levels. The inspectors verified that Dominion's venting surveillance frequencies were consistent with TS and associated bases, and the UFSAR. The inspectors reviewed a sample of system venting surveillance results to ensure proper implementation of the surveillance program.

The inspectors reviewed CAP documents to verify that selected actions described in Dominion's nine-month and supplemental submittals were acceptably documented including completed actions, and implementation schedule for incomplete actions. The inspectors also verified that the commitments in Dominion's submittals were included in the CAP. The inspectors specifically verified the installation of hardware vents, located in the containment spray and emergency core cooling suction header and the safety injection discharge piping, as committed to in Dominion's GL response. Additionally, the inspectors reviewed evaluations and corrective actions for various issues Dominion identified during their GL 2008-01 review. The inspectors performed this review to

ensure Dominion appropriately evaluated and adequately addressed any gas voiding concerns, including the evaluation of operability for gas voids discovered in the field. Finally, the inspectors reviewed Dominion's training associated with gas accumulation to assess if appropriate training had been provided to the operations and engineering support staff to ensure appropriate awareness of the effects of gas voiding. This completes the inspection requirements for TI 2515/177 at Units 2 and 3.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On April 19, 2012, the inspectors presented the inspection results to Stephen E. Scace, Site Vice President, and other members of the Millstone staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

**ATTACHMENT: SUPPLEMENTARY INFORMATION**

## SUPPLEMENTARY INFORMATION

## KEY POINTS OF CONTACT

Licensee Personnel

| | |
|---|---|
| M. Adams | Plant Manager |
| L. Armstrong | Manager, Training |
| R. Arquaro | Unit 3 Shift Manager |
| G. Auria | Nuclear Chemistry Supervisor |
| B. Bartron | Supervisor, Licensing |
| R. Beale | Unit 2 Shift Manager |
| R. Bonner | Nuclear Engineering Supervisor |
| R. Burnham | Consulting Engineer |
| C. Chapin | Assistant Operations Manager |
| W. Chestnut | Supervisor, Nuclear Shift Operations Unit 2 |
| F. Cietek | Nuclear Engineer, PRA |
| T. Cleary | Licensing Engineer |
| G. Closius | Licensing Engineer |
| L. Crone | Supervisor, Nuclear Chemistry |
| J. Curling | Manager, Protection Services |
| G. D'Auria | Nuclear Supervisor, Chemistry |
| P. Dillon | Nuclear Engineer III |
| J. Dorosky | Health Physicist III |
| B. Ferguson | Unit 2 Shift Manager |
| M. Finnegan | Supervisor, Health Physics, ISFSI |
| A. Gharakhanian | Nuclear Engineer III |
| W. Gorman | Supervisor, Instrumentation & Control |
| D. Grindle | Senior Nuclear Instrumentation Technician |
| J. Grogan | Assistant Operations Manager |
| K. Grover | Manager, Nuclear Operations |
| C. Houska | I&C Technician |
| C. Janus | Nuclear Engineer III |
| P. Kolz | Nuclear Chemistry Technician |
| J. Kunze | Supervisor, Nuclear Operations Support |
| J. Laine | Manager, Radiation Protection/Chemistry |
| M. Legg | Manager, Nuclear Oversight |
| M. O'Neill | Unit 3 Plant Equipment Operator |
| R. MacManus | Director, Nuclear Station Safety & Licensing |
| G. Marshall | Manager, Outage and Planning |
| R. McDonald | Nuclear Engineer III |
| H. McKenney | Supervisor Nuclear Operations Support |
| D. Reed | Unit 3 Shift Manager |
| R. Riley | Supervisor, Nuclear Shift Operations Unit 3 |
| M. Roche | Senior Nuclear Chemistry Technician |
| D. Russo | Nuclear Engineer Level III |
| L. Salyards | Licensing, Nuclear Technology Specialist |
| J. Semancik | Engineering Director |
| S. Scace | Site Vice President |
| C. Sloan | Nuclear Plant Equipment Operator |

| | |
|---|---|
| A. Smith | Asset Management |
| D. Smith | Manager, Emergency Preparedness |
| S. Smith | Manager, Engineering |
| S. Turowski | Supervisor, Health Physics Technical Services |
| C. Vournazos | IT Specialist, Meteorological Data |
| B. Wilkens | Site Fire Marshall, Senior Safety Specialist |

## LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Closed

| | | |
|---|---|---|
| 005000336,423/2515/177 | TI | Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal and Containment Spray Systems (4OA5) |

## LIST OF DOCUMENTS REVIEWED

### Section 1R04: Equipment Alignment

Procedures
OP 2315A-001, "Control Room Air Conditioning System," Revision 006-05
OP 2346A-011, "'A'DG Service Water Valve Alignment," Revision 000-04
OP 2346A-012, "'A' DG Starting Air Valve Alignment," Revision 000-00
OP 2346A-013, "'A' DG Jacket Water Valve Alignment," Revision 000-02
OP 2346A-014, "'A' DG Lube Oil Valve Alignment," Revision 000-02
OP 2346B-002, "'A' DG Fuel Oil Valve Alignment," Revision 000-00

### Section 1R05: Fire Protection

Procedures
U2-24-FRR-FHA, Millstone Unit 2 Fire Hazards Analysis (FHA), Revision 12
Millstone Unit 2 Firefighting Strategies, April 2002

### Section 1R11: Licensed Operator Requalification Program

Condition Reports
CR458763

Miscellaneous
ES 12-1A, "MP2 LORT Cycle Operating Exam"
LORT SE46, Revision 2, Change 1

## Section 1R12: Maintenance Effectiveness

Procedures
ER-AA-MRL-100, "Implementing Maintenance Rule," Revision 5
ER-AA-BKR-1001, "Circuit Breaker Program," Revision 0
ER-AA-SYS-1003, "System Performance Monitoring," Revision 3
NF-AA-PRA-101-3060, "Probabilistic Risk Assessment Procedures and Methods: Maintenance Rule Performance Criteria," Revision 0

Condition Reports
CR458424
CR458756
CR459688
CR380201
CR451919
CR454196
CR457931
CA223098

Miscellaneous
Condensate, CPF, and Main Feedwater system Health Report 1st Quarter 2011 and 2012
Main Feedwater Unavailability, November 2009 to November 2011
System 3322 Auxiliary Feedwater & DWST Health Report January 1, 2011 to March 31, 2011
System 3322 Auxiliary Feedwater & DWST Health Report April 1, 2011 to June 30, 2011
System 3322 Auxiliary Feedwater & DWST Health Report July 1, 2011 to September 30, 2011
System 3322 Auxiliary Feedwater & DWST Health Report October 1, 2011 to December 31, 2011
Unit 3 480 VAC MCC System Health Report 1st Quarter 2012

| | | |
|---|---|---|
| MRE011803 | MRE013726 | MRE014540 |
| MRE012148 | MRE014038 | MRE011808 |
| MRE012166 | MRE014334 | MRE011941 |
| MRE013602 | MRE014341 | MRE011983 |
| MRE013623 | MRE014382 | MRE012074 |
| MRE013849 | MRE014393 | MRE013162 |
| MRE013911 | MRE014413 | MRE013819 |
| MRE014177 | MRE014456 | MRE014048 |
| MRE011826 | MRE014469 | MRE014058 |
| MRE011938 | MRE014476 | MRE014060 |
| MRE011948 | MRE014491 | MRE014361 |
| MRE012026 | MRE014517 | MRE014365 |
| MRE012041 | MRE014518 | MRE014384 |
| MRE012052 | MRE014521 | MRE014385 |
| MRE012292 | MRE014522 | MRE014414 |
| MRE012515 | MRE014537 | MRE014460 |
| MRE013428 | MRE014539 | MRE014485 |

## Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures
NF-AA-PRA-370, "Probabilistic Risk Assessment Procedures and Methods: PRA Guidance for MRule (a)(4)," Revision 12

Miscellaneous
High Risk Contingency Plan for Cutting Synchrophasor Metering Unit into the 310 Line
EOOS Operator Risk Report dated January 18, 2012
High Risk Contingency Plan dated February 7, 2012
Troubleshooting plan for CR463624

**Section 1R15: Operability Evaluations**

Procedures
U2 EN7, "Unit 2 High Energy Line Break (HELB) Barrier Inspection," Revision 002-02

Condition Reports

| | | |
|---|---|---|
| CR427558 | CR460806 | CR464818 |
| CR445936 | CR460807 | CR465069 |
| CR460214 | CR460830 | CR465095 |
| CR460803 | CR460065 | |
| CR460805 | CR464272 | |

Miscellaneous
98ENG02718C2, "MP2 Auxiliary and Turbine Buildings, HELB Barrier Steam Infiltration Analysis," Revision 0
OD000463, Unit 3 'A' EDG Load Exceeds Continuous Load Rate
OD000468, Unit 3 'A' EDG Load Swings
Calc RPS-ESF-0428613, "SG Level Uncertainty"
Calc 3444A01-0112E3, "SG Level Instrument Scaling"
Rosemount 10CFR21 Notification dated February 23, 2012
Rosemount 10CFR21 Notification dated March 2, 2012
Wyle Laboratories Test Report 47506-02

**Section 1R18: Plant Modifications**

Procedures
CM-AA-RSK-1001, "Engineering Risk Assessment"

Condition Reports
CR464272
CR464430
CR465069
CR465095

Maintenance Orders/Work Orders
53M20602364

Miscellaneous
Temp Mod 3-12-005, "Increase Bistable Setpoint of 3FWS*LB547B, 'D' Steam Generator Low-low Water Level Reactor Trip and Aux Feedwater Initiation," Revision 000
Calc RPS-ESF-0428613, "SG Level Uncertainty"
Calc 3444A01-0112E3, "SG Level Instrument Scaling"
Rosemount 10CFR21 Notification dated March 2, 2012
DM2-00-0253-09, "Replacement of Rosemount Transmitter RTD with Moore Industries Flexible RTD"

**Section 1R19: Post-Maintenance Testing**

Procedures
SP 2613I-001, "'A' EDG Loss of Load Test," Revision 003
OP 2346A-004, "'A' EDG Data Sheet," Revision 023-09
SP 2624A-001, "'A' EDG Starting Air Vent Valves IST," Revision 000-03
SP 3646A.1-001, "EDG 'A' Operability Tests," Revision 018-02
OP 3346A-014, "EDG 'A' – Operating Log," Revision 012
SP 3622.3, "Auxiliary Feedwater Pump 3FWA*P2 Operational Readiness Test," Revision 017-09
SP3622.3-001, "TDAFW Pump Operational Readiness Test and Quarterly IST Group B Pump Tests," Revisions 014-04 and 014-05

Condition Reports

| | | |
|---|---|---|
| CR463767 | CR467858 | CR468133 |
| CR467660 | CR468001 | CR468137 |
| CR467654 | CR468122 | |
| CR467657 | CR468131 | |

Maintenance Orders/Work Orders

| | | |
|---|---|---|
| WO 53102493358 | WO 53102449638 | WO 53102465248 |
| WO 53102463914 | WO 53102501255 | WO 53102504479 |
| WO 53102480231 | WO53102510734 | WO 53102504493 |
| WO 53102457360 | WO 53102278486 | WO 53102511132 |
| WO 53102500853 | WO 53102434017 | WO 53102511051 |
| WO 53102495719 | WO 53102447008 | |
| WO 53102421224 | WO 53102500994 | |

Miscellaneous
DCN MP3-11-01128, "Operations acceptance Checklist for 3CNM-P1C motor connections"

**Section 1R22: Surveillance Testing**

Procedures
SP 2602A-001, "Manual RCS Leak Rate Determination," Revision 006-02
SP 2610BO-001, "2-MS-201, 2-MS-202 and 2-MS-464 (SV-4188) Stroke and Timing IST," Revision 001-03
SP 2610BO-004, "AFP Turbine Trip Throttle Valve Exercise Test," Revision 000-00
CP 2802N, "Primary Systems Sampling and Analysis," Revision 001-03
SP 3855, "Reactor Coolant analysis for Dose Equivalent I-131," Revision 007-02
C OP 200.15, "RCS Leakage Trending and Investigation," Revision 1
NF-AA-NSA-101-5009, "Reactor Coolant System Leak Rate Monitoring," Revision 1
SP 3601F.6, "Reactor Coolant System, Water Inventory Measurement," Revision 006-06
SP 3601F.6-001, "RCS Inventory Balance," Revision 003-02

Condition Reports
CR457939

Miscellaneous
Reactor Coolant Leakage Report for 2011 dated February 23, 2012

**Section 2RS01, 2RS02, 2RS04: Radiological Hazard Assessment and Exposure Controls, Occupational ALARA Planning and Controls, Occupational Dose Assessment**

Condition Reports
463685; 4558425, 450892, 461061, 461473, 459978

Procedures
RP-AA-105, Revision 0, External Radiation Exposure Control Program
RPM-1.3.13, Revision 010-01, Bioassay Sampling and Analysis
RP-AA-123, Revision 2, Effective Dose Equivalent
PM-2.5.8, Revision 004-01, Stay Time Tracking and Multi-Badging for Special Work
RP-AA-150, Revision 2, TLD Performance Testing
NVLAP Certificate of Accreditation to ISO/IEC 17025:2005 for Mirion Technologies (GDS), Inc.
Dominion Site Audit of Global Solutions, Inc. (MIRION), 2009
NVLAP On-Site Assessment Report for Mirion Technologies (GDS), Inc. February 2012
Calibration for Accuscan Whole Body Counter, December 2011
GEL Laboratories Scope of Accreditation to ISO/IEC 17025:2005

**Section 4OA1: Performance Indicator Verification**

Miscellaneous
NEI 99-02, "Regulatory Assessment Performance Guidelines," Revision 6
Unit 2 Dose Equivalent I-131 Activity for 2011
Unit 2 Identified Leakage for 2011
Unit 3 Reactor Coolant Leakage Report for 2011 dated February 23, 2012
Unit 3 RCS Specific Activity Database for 2011 dated February 29, 2012
NRC PI BI01, "RCS Specific Activity, Millstone Unit 3, January through December 2011"
NRC PI BI02, "RCS Leak Rate Millstone Unit 3 for January through December 2011"
C OP 200.15, "RCS Leakage Trending and Investigation," Revision 1
NF-AA-NSA-101-5009, "Reactor Coolant System Leak Rate Monitoring," Revision 1
NF-AA-FPA-3301, "Reactor Coolant Radiochemistry Analysis," Revision 2
NF-AA-FPA-3002, "Monthly Fuel Reliability Indicator," Revision 1
SP 3601F.6, "Reactor Coolant System, Water Inventory Measurement," Revision 006-06
SP 3601F.6-001, "RCS Inventory Balance," Revision 003-02

**Section 4OA2: Problem Identification and Resolution**

Procedures
SP 2602A, "Reactor Coolant Leakage," Revision 006-03
SP 2602A-001, "Manual RCS Leak Rate Determination," Revision 006-002

**Section 4OA5: Other Activities**

Calculations and Evaluations
98-ENG-02558M2, Determination of Minimum Submergence Criteria for RWST Suction Piping, Revision 0
M2-EV-08-0027, Technical Evaluation for Generic Letter 2008-01 Response, Millstone Unit 2, Revision 0
M2-EV-09-0015, Basis of GL 2008-01 ECCS, DHR & CS Gas Accumulation Surveillance Program, Millstone Unit 2, Revision 0

M3-EV-04-0021, Technical Evaluation for Generic Letter 2008-01 Response, Millstone Unit 3, Revision 2
M3-EV-05-0008, Determination of Allowable ECCS Gas Accumulations in Support of Surveillance 4.5.2.b.1, Millstone Unit 3, Revision 5
M3-EV-08-0026, Technical Evaluation for Generic Letter 2008-01 Response, Millstone Unit 3, Revision 2
M3-EV-08-0035,"Evaluation of Gas Void Discovered in the 24" RWST ECCS Supply Line," Revision 0
S-04425S3, MP3 RELAP5 Analysis of Gas Void in the ECCS Suction Piping from RWST, Revision 0

Completed Tests/Procedures/Examinations
SP 2604Z, ECCS, SDC and CS System Gas Accumulation Verification, Quarterly UT Results from April 2010 – January 2012
SP 3606.5, Containment Recirculation Spray System Train 'A' Valve Lineup and Loop Seal Verification, Monthly UT Results from December 2009 – December 2011
SP 3606.6, Containment Recirculation Spray System Train 'B' Valve Lineup and Loop Seal Verification, Monthly UT Results from December 2009 – December 2011
SP 3608.4, High Pressure Safety Injection System Vent and Valve Lineup Verification, Monthly UT Results from December 2009 – December 2011
SP 3610A.3, RHR System Vent and Valve Lineup Verification, Monthly UT Results from December 2009 – December 2011

Procedures
ER-AA-NDE-UT-724, Ultrasonic Examination Procedure for Liquid Level Measurements, Revision 1
OP 2308X11, 'A' HPSI Pump Maintenance, Revision 7
OP 2308X51, 'B' HPSI Pump Maintenance, Revision 4
OP 2309X11, 'A' CS Pump Maintenance, Revision 0
OP 2353A, Filling and Venting Various Emergency Core Cooling System Piping and Components, Revision 7
OP 2353C, Filling and Venting SIT Recirculation Header, Revision 1
OP 3250.04A, Charging Pump Fill and Vent, Revision 0
OP 3250.08, Safety Injection System Fill and Vent, Revision 0
OP 3250.09, QSS Pump Discharge Header Fill, Revision 0
OP 3250.10A, Removing RHR from Service for LLRT or Maintenance, Revision 3
OP 3304A, Charging and Letdown, Revision 31
OP 3304C, Primary Makeup and Chemical Addition, Revision 23
OP 3309, Quench Spray, Revision 13
OP 3310A, Residual Heat Removal System, Revision 17
OP 3310B, Accumulator Low Pressure Safety Injection, Revision 15
SP 2604Z, ECCS, SDC, and CS System Gas Accumulation Verification, Revision 1
SP 3604A.5, Chemical and Volume Control System Valve Operability Test, Revision 13
SP 3606.6, Containment Recirculation Spray System Train 'B' Valve Lineup and Loop Seal Verification, Revision 4
SP 3608.6, Safety Injection System Valve Operability Test, Revision 14
SP 3610A.3, RHR System Vent and Valve Lineup Verification, Revision 7

Drawings
25203-20146, Isometric – Refueling Water Supply, Unit 2, Sheet 422, Revision 4
25203-20150, Isometric – Containment Spray System, Unit 2, Sheet 13, Revision 10

25203-20150, Isometric – Containment Spray System, Unit 2, Sheet 81, Revision 8
25203-20150, Isometric – H.P. and L.P. Injection and Containment Spray Pump Suction, Unit 2, Sheet 2, Revision 28
25203-20150, Isometric - High Pressure and Low Pressure Injection and Containment Spray Pump Suction, Unit 2, Sheet 1, Revision 23
25203-20150, Isometric – Shutdown Cooling from Exchanger to Spray Header, Unit 2, Sheet 71, Revision 18
25203-20150, Isometric – Shutdown Cooling from Exchanger to Spray Header, Unit 2, Sheet 13, Revision 10
25203-20150, Low Pressure Safety Injection Pump Discharge, Sheet 8, Revision 28
25203-26015, P&ID - High Pressure Safety Injection Pumps, Unit 2, Sheet 2, Revision 41
25203-26015, P&ID – LP Safety Injection System, Unit 2, Sheet 1, Revision 38
25203-26015, P&ID – LP Safety Injection System, Unit 2, Sheet 2, Revision 41
25203-26015, P&ID - Safety Injection Tanks, Unit 2, Sheet 3, Revision 30
25212-20402, Isometric - Quench Spray System, Unit 3, Sheet 21, Revision 6
25212-20403, Fabrication Installation Control Drawing ASME Section III, Code Class 2, Sheet 17, Revision 9
25212-26904, P&ID - Chemical and Volume Control, Unit 3, Sheet 1, Revision 54
25212-26904, P&ID - Chemical and Volume Control, Unit 3, Sheet 3, Revision 54
25212-26912, P&ID – Low Pressure Safety Injection, Unit 3, Sheet 1, Revision 50
25212-26912, P&ID – Low Pressure Safety Injection/Containment Recirculation, Unit 3, Sheet 3, Revision 38
25212-26913, P&ID - High Pressure Safety, Unit 3, Sheet 1, Revision 39
25212-26913, P&ID - High Pressure Safety, Unit 3, Sheet 2, Revision 39
25212-26915, P&ID – Quench Spray & H2 Recombiner – Unit 3, Revision 37

Design Changes
DM2-00-0007-09, Installation of Vent Valves on High/Low Pressure SI Discharge Header Piping to RCS Loops 2A/2B, Revision 0
DM2-00-0380-08, Addition of Vent Valves to Containment Spray and LPSI/HPSI Suction Piping, Revision 0

Miscellaneous
C11504C, Outage OE Training, dated August 22, 2011
Millstone Unit 2 Potential Areas for Gas Intrusion in Unit 2, Attachment B, Revision 0
System Health Report, Chemical and Volume Control, Unit 3, 3rd Quarter 2011
System Health Report, Containment Recirculation Spray, Unit 3, 3rd Quarter 2011
System Health Report, Containment Spray and RWST, Unit 2, 3rd Quarter 2011
System Health Report, LPSI and Shutdown Cooling, Unit 2, 3rd Quarter 2011
System Health Report, Quench Spray and RWST, Unit 3, 3rd Quarter 2011
System Health Report, Residual Heat Removal, Unit 3, 3rd Quarter 2011
System Health Report, High Head Safety Injection, Unit 3, 3rd Quarter, 2011
TM-1876A, Transport of a Small Air Pocket, Creare Incorporated dated February 1998

Design & Licensing Bases
Letter from J. A. Price (Dominion Nuclear Connecticut, Inc.) to USNRC, “Nine-Month Response to NRC Generic Letter 2008-01” dated October 14, 2008
Letter from W. R. Matthews (Dominion Nuclear Connecticut, Inc.) to USNRC, “Supplemental Response to the NRC Generic Letter 2008-01” dated January 15, 2009
Letter from L.N. Hartz (Dominion Nuclear Connecticut, Inc.) to USNRC, “Response to Request for Additional Information Regarding Generic Letter 2008-01” dated January 14, 2010

Millstone Nuclear Power Station - Technical Specifications, Unit 2, Amendment 309
Millstone Nuclear Power Station - Technical Specifications, Unit 3, Amendment 252
Millstone Nuclear Power Station Updated Final Safety Analysis Report, Unit 2, Revision 28
Millstone Nuclear Power Station Updated Final Safety Analysis Report, Unit 3, Revision 23

Corrective Action Documents

| | | | |
|---|---|---|---|
| 113720 | 168879 | 356722 | 460344 |
| 113726 | 319295 | 359613 | 461221 |
| 114275 | 319371 | 369371 | 461308 |
| 118407 | 322563 | 377876 | 461437 |
| 166748 | 327719 | 347276 | 454766 |
| 455434 | 461455 | | |

## LIST OF ACRONYMS

| | |
|---|---|
| ADAMS | Agencywide Documents Access and Management System |
| ALARA | as low as reasonably achievable |
| CAP | Corrective Action Program |
| CFR | Code of Federal Regulations |
| CR | condition reports |
| CRAC | control room air conditioning system |
| DRP | Division of Reactor Projects |
| DRS | Division of Reactor Safety |
| EDG | emergency diesel generator |
| EP | emergency preparedness |
| GL | generic letter |
| HPSI | high pressure safety injection |
| IMC | Inspection Manual Chapter |
| INPO | Institute of Nuclear Power Operations |
| MDA | minimum detectable activity |
| NCV | non-cited violation |
| NEI | Nuclear Energy Institute |
| NRC | Nuclear Regulatory Commission |
| NVLAP | National Voluntary Laboratory Accreditation Program |
| ODM | operational decision making |
| OOS | out of service |
| PARS | Publicly Available Records |
| RCP | reactor coolant pump |
| RCS | reactor coolant system |
| RWP | radiation work permit |
| SBO | station blackout |
| SDP | significance determination process |
| SG | steam generator |
| SI | safety injection |
| SSC | structures, systems, and components |
| SW | service water |
| TI | temporary instruction |
| TS | technical specifications |
| UFSAR | Updated Final Safety Analysis Report |
| UT | ultrasonic test |
| URI | unresolved item |

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 2, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Nuclear Connecticut, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION, UNIT NOS. 2 AND 3: SUPPLEMENTAL RESPONSE TO BULLETIN 2005-02, "EMERGENCY PREPAREDNESS AND RESPONSE ACTIONS FOR SECURITY-BASED EVENTS" (TAC NOS. MC7841 AND MC7842)

Dear Mr. Heacock:

On July 18, 2005, the U.S. Nuclear Regulatory Commission (NRC) issued Bulletin (BL) 2005-02, "Emergency Preparedness and Response Actions for Security-Based Events,"[1] to all holders of operating licenses for nuclear power reactors, except those who have permanently ceased operation and have certified that fuel has been removed from the reactor vessel.

BL 2005-02 notified licensees of the NRC staff's need for information associated with emergency preparedness for security-based events at nuclear power plants. The purpose of the BL was for the NRC to obtain information regarding changes licensees have made or plan to make concerning security-based emergency preparedness program capabilities and to evaluate how such changes have been consistently implemented. Licensees were requested to respond to questions and provide information in the following areas:

A. Security-Based Emergency Classification Levels and Emergency Action Levels;
B. NRC Notifications;
C. Onsite Protective Measures;
D. Emergency Response Organization Augmentation; and
E. Drill and Exercise Program.

The Nuclear Energy Institute (NEI) developed a white paper, entitled "Enhancements to Emergency Preparedness Programs for Hostile Action," dated May 2005 (revised November 18, 2005)[2] to clarify various options available to licensees to implement the enhancements discussed in BL 2005-02. NEI requested endorsement of these options in a letter dated November 22, 2005. The NRC staff issued Regulatory Issue Summary 2006-12 on July 19, 2006, endorsing the white paper clarification.

[1] Agencywide Document Access and Management System (ADAMS) Accession No. ML051740058
[2] ADAMS Accession No. ML053290326

By letter dated August 16, 2005,[3] and January 3, 2006,[4] Virginia Electric and Power Company, Dominion Energy Kewaunee, Inc., and Dominion Nuclear Connecticut, Inc. (collectively Dominion) responded to BL 2005-02 for North Anna Power Station, Unit Nos. 1 and 2, Surry Power Station, Unit Nos. 1 and 2, Kewaunee Power Station, and Millstone Power Station, Unit Nos. 2 and 3 (Millstone). By letter dated November 20, 2006,[5] the NRC staff stated that the Dominion response to BL 2005-02 was considered acceptable and that no further action was requested at that time.

It has recently been brought to the NRC staff's attention that a Millstone-specific response to BL 2005-02 was submitted for NRC review on January 4, 2006.[6] The NRC staff was not aware of this response at the time, and therefore did not review the January 4, 2006, response as part of the Millstone BL 2005-02 response. Since becoming aware of the January 4, 2006, response, the NRC staff has reviewed the information provided and has determined that the Millstone response to BL 2005-02 remains acceptable and that no further action is requested at this time.

If you have any questions, please contact me at 301-415-1603.

Sincerely,

Carleen J. Sanders, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-336 and 50-423

cc: Distribution via Listserv

[3] ADAMS Accession No. ML052290489
[4] ADAMS Accession No. ML060040032
[5] ADAMS Accession No. ML063250187
[6] ADAMS Accession No. ML060100301 (letter; the enclosure contains safeguards information and as such is not publicly available)

By letter dated August 16, 2005,[7] and January 3, 2006,[8] Virginia Electric and Power Company, Dominion Energy Kewaunee, Inc., and Dominion Nuclear Connecticut, Inc. (collectively Dominion) responded to BL 2005-02 for North Anna Power Station, Unit Nos. 1 and 2, Surry Power Station, Unit Nos. 1 and 2, Kewaunee Power Station, and Millstone Power Station, Unit Nos. 2 and 3 (Millstone). By letter dated November 20, 2006,[9] the NRC staff stated that the Dominion response to BL 2005-02 was considered acceptable and that no further action was requested at that time.

It has recently been brought to the NRC staff's attention that a Millstone-specific response to BL 2005-02 was submitted for NRC review on January 4, 2006.[10] The NRC staff was not aware of this response at the time, and therefore did not review the January 4, 2006, response as part of the Millstone BL 2005-02 response. Since becoming aware of the January 4, 2006, response, the NRC staff has reviewed the information provided and has determined that the Millstone response to BL 2005-02 remains acceptable and that no further action is requested at this time.

If you have any questions, please contact me at 301-415-1603.

Sincerely,

***/ra/***

Carleen J. Sanders, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-336 and 50-423

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| RidsOgcRp Resource | RidsRgn1MailCenter Resource | Branch Reading |
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**ADAMS Accession No.: ML121080610** ***via email**

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|---|---|---|---|---|---|---|
| NAME | CSanders | ABaxter * | JAnderson | KMorgan-Butler | MKhanna | CSanders |
| DATE | 04/27/2012 | 04/26/12 | 04/27/12 | 04/30/12 | 05/02/12 | 05/02/12 |

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[7] ADAMS Accession No. ML052290489
[8] ADAMS Accession No. ML060040032
[9] ADAMS Accession No. ML063250187
[10] ADAMS Accession No. ML060100301 (letter; the enclosure contains safeguards information and as such is not publicly available)

**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
**REGION I**
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

May 9, 2012

Mr. David A. Heacock
Sr. Vice President and Chief Nuclear Officer
Dominion Resources
500 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: ASSESSMENT FOLLOW-UP LETTER FOR MILLSTONE POWER STATION UNIT 2 (05000336/2012009)

Dear Mr. Heacock:

On May 1, 2012, the U. S. Nuclear Regulatory Commission (NRC) staff completed its quarterly review of plant performance for Millstone Power Station Unit 2. The NRC reviewed the most recent quarterly performance indicators (PIs) and inspection results. This letter informs you of the NRC's assessment of your facility and its plans for future inspections at your facility. This letter supplements, but does not supersede, the annual assessment letter issued on March 5, 2012 (ADAMS Accession No. ML12061A240).

The NRC determined the performance at Millstone Power Station Unit 2 during the most recent quarter was within the Regulatory Response Column of the NRC's Reactor Oversight Process (ROP) Action Matrix, based on one finding originating in the second quarter of 2011 having low to moderate safety significance (White) in the Initiating Events Cornerstone. This finding involved the failure of Millstone Unit 2 personnel to carry out their assigned roles and responsibilities and inadequate reactivity management during main turbine control valve testing, which contributed to an unintended eight percent reactor power transient (88 percent to 96 percent) on February 12, 2011. The details of this finding were documented in NRC Special Inspection Team (SIT) report 05000336/2011008 (ADAMS Accession No. ML111470484).

The SIT concluded that the plant operated within acceptable power limits and no equipment malfunctioned during the power transient. Additionally, prior to leaving the site, the team verified the immediate corrective actions taken by Dominion, which included the removal of the Millstone Unit 2 control room crew involved in the transient from operational duties pending remediation, issuance of a standing order, and temporarily establishing a continuous management presence in the Millstone Unit 2 control room while long term corrective actions were developed.

As a result of our quarterly review of Millstone Power Station Unit 2 performance, we plan to conduct a supplemental inspection using NRC Inspection Procedure 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area," when your staff has notified us of your readiness for this inspection. This inspection procedure is conducted to provide assurance that the root cause and contributing causes of risk significant performance issues are understood, the extent of condition is identified, and the corrective actions are sufficient to prevent recurrence.

During a telephone conversation on May 4, 2012, Mr. Stephen Scace, Millstone Site Vice President, informed me that Millstone is completing corrective actions to address the White finding. Since the supplemental inspection has not been completed within the finding's first four calendar year quarters, the finding will remain open and will continue to be an input into the NRC's ROP Action Matrix. As a result, Millstone Power Station Unit 2 will remain in the Regulatory Response Column until a successful supplemental inspection is completed. The NRC's process for held-open findings is described in NRC Inspection Manual Chapter 0305, "Operating Reactor Assessment Program."

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Please contact Ronald R. Bellamy at (610) 337-5200 with any questions you have regarding this letter.

Sincerely,

/***RA***/

Darrell J. Roberts, Director
Division of Reactor Projects

Docket No. 50-336
License No. DPR-65

cc w/encl: Distribution via ListServ

During a telephone conversation on May 4, 2012, Mr. Stephen Scace, Millstone Site Vice President, informed me that Millstone is completing corrective actions to address the White finding. Since the supplemental inspection has not been completed within the finding's first four calendar year quarters, the finding will remain open and will continue to be an input into the NRC's ROP Action Matrix. As a result, Millstone Power Station Unit 2 will remain in the Regulatory Response Column until a successful supplemental inspection is completed. The NRC's process for held-open findings is described in NRC Inspection Manual Chapter 0305, "Operating Reactor Assessment Program."

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Please contact Ronald R. Bellamy at (610) 337-5200 with any questions you have regarding this letter.

Sincerely,
/***RA***/
Darrell J. Roberts, Director
Division of Reactor Projects

Docket No. 50-336
License No. DPR-65
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DRS Branch Chiefs (6)
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D. Screnci, PAO,
N. Sheehan, PAO
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RidsNRRPM Millstone Resource
RidsNRRDorlLpl1-2 Resource
ROPreportsResource

DOCUMENT NAME: G:\DRP\BRANCH5\3-MS\MS 2012 1Q Follow-up Assessment Letter.docx
ADAMS ACCESSION NUMBER: **ML12130A172**

| ☑ SUNSI Review | | ☑ Non-Sensitive<br>☐ Sensitive | | ☑ Publicly Available<br>☐ Non-Publicly Available | |
|---|---|---|---|---|---|
| OFFICE | RI/DRP | RI/DRP | RI/DRP | RI/DRP | |
| NAME | TSetzer | RPowell | RBellamy | DRoberts | |
| DATE | 05/07/12 | 05/07/12 | 05/07/12 | 05/09/12 | |

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 11, 2012

All Power Reactor Licensees and
Holders of Construction Permits in
Active or Deferred Status

SUBJECT: PRIORITIZATION OF RESPONSE DUE DATES FOR REQUEST FOR INFORMATION PURSUANT TO TITLE 10 OF THE *CODE OF FEDERAL REGULATIONS* 50.54(f) REGARDING FLOODING HAZARD REEVALUATIONS FOR RECOMMENDATION 2.1 OF THE NEAR-TERM TASK FORCE REVIEW OF INSIGHTS FROM THE FUKUSHIMA DAI-ICHI ACCIDENT

On March 12, 2012, the U.S. Nuclear Regulatory Commission (NRC) issued a request for information pursuant to Title 10 of the *Code of Federal Regulations*, Part 50, Section 54(f). The purpose of that request was to gather sufficient information to enable the NRC staff to determine whether the nuclear plant licenses under your responsibility should be modified, suspended, or revoked. Enclosure 2 to that letter directed the reevaluation of flooding hazards at operating reactor sites. The required response section of Enclosure 2 indicated that the Hazard Reevaluation Report would be due within one to three years from the date of the letter. Further, it specified that NRC would provide a prioritization plan indicating deadlines for individual plants to complete the reevaluations. The purpose of this letter is to provide you with the prioritization plan developed by the NRC and the resultant list of due dates for all sites.

Since the issuance of the information request, the NRC has held multiple public meetings and teleconferences to gather stakeholder feedback on this topic. On March 15, 2012, the Nuclear Energy Institute (NEI), on the industry's behalf, provided a methodology for categorizing flooding reevaluations using indicators for susceptibility and complexity.[1] The NRC staff considered the industry's proposal during development of the flood prioritization criteria described below. Additionally, at a public teleconference on May 7, 2012, NEI provided a proposed list of due dates for all sites[2] that included site-specific considerations. The NRC also considered this input in the development of the final list.

The NRC staff used the following criteria to assign plants a schedule for completing the flood hazard reevaluations:

1. What is the potential that an integrated assessment will have to be conducted based upon the reevaluated hazard? (This is based on plant-specific insights available to the staff regarding the potential flood hazard and existing flood protection, combined operating license (COL) and early site permit (ESP) reviews for co-located sites, and the Generic Issue-204 screening report).

2. How quickly can the flooding hazard reevaluation be completed?

[1] The NEI proposed method is available in the Agencywide Documents Access and Management System (ADAMS) under Accession No. ML12075A048.
[2] The NEI proposed list is available in ADAMS under Accession No. ML12125A331.

3. How can industry and staff resources be most effectively and efficiently applied (e.g., a particular utility may have multiple sites and limited in-house expertise; therefore, not all of that utility's sites were placed in the same category)?

The three categories below correspond to the length of time allotted to complete the hazard reevaluation and report the results to the NRC:

Category 1: Licensees in this category are expected to report the results of reevaluations within one year. This category includes most sites that are co-located with an ESP or COL site. Except for the site-specific drainage analysis of the operating units; flooding hazards at these sites have already been analyzed using present-day methodologies and guidance. Therefore, the NRC staff expects that the reevaluated hazards can be reported with relatively little additional effort. Category 1 also includes some sites where the staff is aware that a flooding reanalysis was already started and should be finished within a year. Finally, Category 1 includes some sites where the NRC staff anticipates the reevaluated hazard could potentially result in the need for an integrated assessment.

Category 2: Licensees in this category are expected to report the results of reevaluations within two years. This category includes sites where the analysis is expected to be more complex than those in Category 1 or sites with a complex hazard analysis that is already underway. Examples of more complex hazard analyses include sites that are potentially susceptible to flooding due to multiple upstream dam failures, storm surge, and tsunami hazards.

Category 3: Licensees in this category are expected to report the results of the reevaluations within three years. This category includes sites for which the staff expects reevaluation of flooding hazards will take more than two years to complete, because reevaluation of the hazards for these sites is more complex than Category 2. Examples of more complex hazard analyses include sites potentially susceptible to flooding due to multiple dam failures, storm surge, tsunami hazard, and large watersheds.

If you have any questions on this matter, please contact your NRC licensing Project Manager.

Sincerely,

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation

Enclosures:
1. Prioritization List
2. Licensees

cc: Listserv

Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident

Flooding Hazard Reevaluation Prioritization List for Reactor Sites

**Category 1 Sites - Due March 12, 2013**

Callaway Plant , Unit 1
Calvert Cliffs Nuclear Power Plant, Units 1 & 2
Comanche Peak Nuclear Power Plant, Units 1 & 2
Dresden Nuclear Power Station, Units 2 & 3
Fermi, Unit 2
Grand Gulf Nuclear Station, Unit 1
Hope Creek Generating Station, Unit 1
Indian Point Energy Center, Units 2 & 3
Nine Mile Point Nuclear Station, Units 1 & 2
North Anna Power Station, Units 1 & 2
Oconee Nuclear Station, Units 1, 2, & 3
Quad Cities Nuclear Power Station, Unit 1 & 2
Salem Nuclear Generating Station, Unit 1 & 2
Sequoyah Nuclear Plant, Units 1 & 2
Shearon Harris Nuclear Power Plant, Unit 1
South Texas Project, Units 1 & 2
Three Mile Island Nuclear Station, Unit 1
Turkey Point Nuclear Generating, Units 3 & 4
Vermont Yankee Nuclear Power Station
Virgil C. Summer Nuclear Station, Unit 1
Vogtle Electric Generating Plant, Units 1 & 2
Watts Bar Nuclear Plant, Unit 1 & 2

**Category 2 Sites - Due March 12, 2014**

Arkansas Nuclear One, Units 1 & 2
Beaver Valley Power Station, Units 1 & 2
Braidwood Station, Units 1 & 2
Browns Ferry Nuclear Plant, Units 1, 2 & 3
Byron Station, Units 1 & 2
Catawba Nuclear Station, Units 1 & 2
Clinton Power Station, Unit 1
Columbia Generating Station
Cooper Nuclear Station
Davis-Besse Nuclear Power Station, Unit 1
Duane Arnold Energy Center
Edwin I. Hatch Nuclear Plant, Units 1 & 2

**Category 2 Sites – Due March 12, 2014 (Continued)**

Fort Calhoun Station, Unit 1
H.B. Robinson Steam Electric Plant, Unit 2
Joseph M. Farley Nuclear Plant, Units 1 & 2
Kewaunee Power Station
LaSalle County Station, Units 1 & 2
Monticello Nuclear Generating Plant, Unit 1
Palo Verde Nuclear Generating Station, Units 1, 2, & 3
Peach Bottom Atomic Power Station, Units 2 & 3
Prairie Island Nuclear Generating Plant, Units 1 & 2
River Bend Station, Unit 1
William B. McGuire Nuclear Station, Units 1 & 2
Wolf Creek Generating Station, Unit 1

**Category 3 Sites - Due March 12, 2015**

Bellefonte Nuclear Power Station, Units 1 & 2
Brunswick Steam Electric Plant, Units 1 & 2
Crystal River Nuclear Generating Plant, Unit 3
Diablo Canyon Power Plant, Units 1 & 2
Donald C. Cook Nuclear Plant, Unit 1 & 2
James A. FitzPatrick Nuclear Power Plant
Limerick Generating Station, Units 1 & 2
Millstone Power Station, Units 2 & 3
Oyster Creek Nuclear Generating Station
Palisades Nuclear Plant
Perry Nuclear Power Plant, Unit 1
Pilgrim Nuclear Power Station, Unit 1
Point Beach Nuclear Plant, Units 1 & 2
R. E. Ginna Nuclear Power Plant
San Onofre Nuclear Generating Station, Units 2 & 3
Seabrook Station, Unit 1
St. Lucie Plant, Units 1 & 2
Surry Power Station, Units 1 & 2
Susquehanna Steam Electric Station, Units 1 & 2
Waterford Steam Electric Station, Unit 3

POWER REACTOR LICENSEES AND HOLDERS OF
CONSTRUCTION PERMITS IN ACTIVE OR DEFERRED STATUS

Arkansas Nuclear One
Entergy Operations, Inc.
Docket Nos. 50-313 and 50-368
License Nos. DPR-51 and NPF-6

Mr. Christopher J. Schwarz
Vice President, Operations
Entergy Operations, Inc.
Arkansas Nuclear One
1448 S.R. 333
Russellville, AR 72802

Beaver Valley Power Station
First Energy Nuclear Operating Co.
Docket Nos. 50-334 and 50-412
License Nos. DPR-66 and NPF-73

Mr. Paul A. Harden
Site Vice President
FirstEnergy Nuclear Operating Company
Mail Stop A-BV-SEB1
P.O. Box 4, Route 168
Shippingport, PA 15077

Bellefonte Nuclear Power Station
Tennessee Valley Authority
Docket Nos. 50-438 and 50-439
Construction Permit Nos. CPPR No. 122 and CPPR No. 123

Mr. Michael D. Skaggs
Senior Vice President, Nuclear Generation Development and Construction
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Braidwood Station
Exelon Generation Co., LLC
Docket Nos. STN 50-456 and STN 50-457
License Nos. NPF-72 and NPF-77

Mr. Michael J. Pacilio
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

Browns Ferry Nuclear Plant
Tennessee Valley Authority
Docket Nos. 50-259, 50-260 and 50-296
License Nos. DPR-33, DPR-52 and DPR-68

Mr. Preston D. Swafford
Chief Nuclear Officer and Executive Vice President
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Brunswick Steam Electric Plant
Carolina Power & Light Co.
Docket Nos. 50-325 and 50-324
License Nos. DPR-71 and DPR-62

Mr. Michael J. Annacone
Vice President
Carolina Power & Light Company
Brunswick Steam Electric Plant
P. O. Box 10429
Southport, NC 28461

Byron Station
Exelon Generation Co., LLC
Docket Nos. STN 50-454 and STN 50-455
License Nos. NPF-37 and NPF-66

Mr. Michael J. Pacilio
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

Callaway Plant
Union Electric Co.
Docket No. 50-483
License No. NPF-30

Mr. Adam C. Heflin
Senior Vice President and Chief Nuclear Officer
Union Electric Company
P. O. Box 620
Fulton, MO 65251

Calvert Cliffs Nuclear Power Plant
Calvert Cliffs Nuclear Power Plant, LLC
Docket Nos. 50-317 and 50-318
License Nos. DPR-53 and DPR-69

Mr. George H. Gellrich
Vice President
Calvert Cliffs Nuclear Power Plant, LLC
Calvert Cliffs Nuclear Power Plant
1650 Calvert Cliffs Parkway
Lusby, MD 20657-4702

Catawba Nuclear Station
Duke Energy Carolinas, LLC
Docket Nos. 50-413 and 50-414
License Nos. NPF-35 and NPF-52

Mr. James R. Morris
Site Vice President
Duke Energy Carolinas, LLC
Catawba Nuclear Station
4800 Concord Road
York, SC 29745

Clinton Power Station
Exelon Generation Co., LLC
Docket No. 50-461
License No. NPF-62

Mr. Michael J. Pacilio
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Columbia Generating Station
Energy Northwest
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Comanche Peak Nuclear Power Plant
Luminant Generation Co., LLC
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Cooper Nuclear Station
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Crystal River Nuclear Generating Plant
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Davis-Besse Nuclear Power Station
First Energy Nuclear Operating Co.
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Diablo Canyon Power Plant
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License Nos. DPR-19 and DPR-25

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Duane Arnold Energy Center
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Edwin I. Hatch Nuclear Plant
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License Nos. DPR-57 and NPF-5

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Fort Calhoun Station
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License No. DPR-40

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Grand Gulf Nuclear Station
Entergy Operations, Inc.
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H. B. Robinson Steam Electric Plant
Carolina Power & Light Co.
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License No. DPR-23

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Hope Creek Generating Station
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License Nos. NPF-2 and NPF-8

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Kewaunee Power Station
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License No. DPR-43

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License Nos. NPF-11 and NPF-18

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Limerick Generating Station
Exelon Generation Co., LLC
Docket Nos. 50-352 and 50-353
License Nos. NPF-39 and NPF-85

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Millstone Power Station
Dominion Nuclear Connecticut, Inc.
Docket Nos. 50-336 and 50-423
License Nos. DPR-65 and NPF-49

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Monticello Nuclear Generating Plant
Northern States Power Company
Docket No. 50-263
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License Nos. DPR-63 and NPF-69

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North Anna Power Station
Virginia Electric & Power Co.
Docket Nos. 50-338 and 50-339
License Nos. NPF-4 and NPF-7

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Oconee Nuclear Station
Duke Energy Carolinas, LLC
Docket Nos. 50-269, 50-270 and 50-287
License Nos. DPR-38, DPR-47 and DPR-55

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Oyster Creek Nuclear Generating Station
Exelon Generation Co., LLC
Docket No. 50-219
License No. DPR-16

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Palisades Nuclear Plant
Entergy Nuclear Operations, Inc.
Docket No. 50-255
License No. DPR-20

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Palo Verde Nuclear Generating Station
Arizona Public Service Company
Docket Nos. STN 50-528, STN 50-529 and STN 50-530
License Nos. NPF-41, NPF-51 and NPF-74

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Peach Bottom Atomic Power Station
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License Nos. DPR-44 and DPR-56

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Perry Nuclear Power Plant
First Energy Nuclear Operating Co.
Docket No. 50-440
License No. NPF-58

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License No. DPR-35

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Point Beach Nuclear Plant
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License Nos. DPR-24 and DPR-27

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Prairie Island Nuclear Generating Plant
Northern States Power Co. Minnesota
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License Nos. DPR-42 and DPR-60

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License Nos. DPR-29 and DPR-30

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License Nos. DPR-70 and DPR-75

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San Onofre Nuclear Generating Station
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Docket Nos. 50-335 and 50-389
License Nos. DPR-67 and NPF-16

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License No. DPR-50

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Turkey Point
Florida Power & Light Co.
Docket Nos. 50-250 and 50-251
License Nos. DPR-31 and DPR-41

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License No. DPR-28

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Virgil C. Summer Nuclear Station
South Carolina Electric & Gas Co.
Docket No. 50-395
License No. NPF-12

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Vogtle Electric Generating Plant
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License Nos. NPF-68 and NPF-81

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Waterford Steam Electric Station
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Watts Bar Nuclear Plant, Unit 1
Tennessee Valley Authority
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License No. NPF-90

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Watts Bar Nuclear Plant, Unit 2
Tennessee Valley Authority
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Construction Permit No. CPPR No. 092

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Wolf Creek Generating Station
Wolf Creek Nuclear Operating Corp.
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License No. NPF-42

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3. How can industry and staff resources be most effectively and efficiently applied (e.g., a particular utility may have multiple sites and limited in-house expertise; therefore, not all of that utility's sites were placed in the same category)?

The three categories below correspond to the length of time allotted to complete the hazard reevaluation and report the results to the NRC:

Category 1: Licensees in this category are expected to report the results of reevaluations within one year. This category includes most sites that are co-located with an ESP or COL site. Except for the site-specific drainage analysis of the operating units; flooding hazards at these sites have already been analyzed using present-day methodologies and guidance. Therefore, the NRC staff expects that the reevaluated hazards can be reported with relatively little additional effort. Category 1 also includes some sites where the staff is aware that a flooding reanalysis was already started and should be finished within a year. Finally, Category 1 includes some sites where the NRC staff anticipates the reevaluated hazard could potentially result in the need for an integrated assessment.

Category 2: Licensees in this category are expected to report the results of reevaluations within two years. This category includes sites where the analysis is expected to be more complex than those in Category 1 or sites with a complex hazard analysis that is already underway. Examples of more complex hazard analyses include sites that are potentially susceptible to flooding due to multiple upstream dam failures, storm surge, and tsunami hazards.

Category 3: Licensees in this category are expected to report the results of the reevaluations within three years. This category includes sites for which the staff expects reevaluation of flooding hazards will take more than two years to complete, because reevaluation of the hazards for these sites is more complex than Category 2. Examples of more complex hazard analyses include sites potentially susceptible to flooding due to multiple dam failures, storm surge, tsunami hazard, and large watersheds.

If you have any questions on this matter, please contact your NRC licensing Project Manager.

Sincerely,
***/ra/***
Eric J. Leeds, Director
Office of Nuclear Reactor Regulation

Enclosures:
1. Prioritization List
2. Licensees

cc: Listserv

Distribution: See next page
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 22, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
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Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION, UNIT NO. 2 - REVIEW OF THE CORE OPERATING LIMITS REPORT (COLR), CYCLE 21 (TAC NO. ME6365)

Dear Mr. Heacock:

By letter dated May 19, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11152A148), Dominion Nuclear Connecticut, Inc. (DNC) submitted the Millstone Power Station, Unit 2 (MPS2) Cycle 21 Core Operating Limits Report (COLR) in accordance with Technical Specification (TS) Section 6.9.1.8.d. DNC provided additional information regarding the COLR by letters dated November 30, 2011 (ML11342A122), January 18, 2012 (ML12025A225), and May 1, 2012 (ML12129A200).

The U.S. Nuclear Regulatory Commission (NRC) staff has completed its review of the report and concludes that the revision to the Cycle 21 COLR is acceptable for MPS2 Cycle 21 operation. The NRC staff's safety evaluation of the report is enclosed.

Please contact me at (301) 415-4125 if you have any questions on this issue.

Sincerely,

James Kim

James Kim, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-336

Enclosure:
As stated

cc w/encl: Distribution via Listserv

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BYTHE OFFICE OF NUCLEAR REACTOR REGULATION

RELATING TO CYCLE 21 CORE OPERATING LIMITS REPORT REVISION

DOMINION NUCLEAR CONNECTICUT, INC.

MILLSTONE POWER STATION, UNIT 2

DOCKET NO. 50-336

## 1.0 INTRODUCTION

By letter dated May 19, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11152A148), Dominion Nuclear Connecticut, Inc. (DNC) submitted the Millstone Power Station, Unit 2 (MPS2) Cycle 21 Core Operating Limits Report (COLR) in accordance with Technical Specification (TS) Section 6.9.1.8.d. DNC provided additional information regarding the COLR by letters dated November 30, 2011 (ML11342A122), January 18, 2012 (ML12025A225), and May 1, 2012 (ML12129A200). The proposed revision to the MPS2 COLR includes: (1) revision to page headers to reflect Cycle 21; (2) addition of a penalty factor to account for the impact of offset incore instrument (ICI) detectors on the linear heat rate measurement; and (3) revision to Figure 2.5-1 based on the analysis supporting the offset ICI detectors.

## 2.0 REGULATORY EVALUATION

The U.S. Nuclear Regulatory Commission (NRC) staff considered the following regulatory requirements and guidance in its review of the proposed revision.

Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Section 50.59, "Changes, tests, and experiments," require: (1) under 50.59 (a)(1) a modification or addition to, or removal from, the facility or procedures that affects a design function, method of performing or controlling the function, or an evaluation that demonstrates that intended function will be accomplished; and (2) under 50.59(a)(2) departure from a method of evaluation described in the FSAR [Final Safety Analysis Report] unless the results of the analysis are conservative or essentially the same

10 CFR 50.92, "Issuance of amendment," requires involvement of the material alternation of a licensed facility.

10 CFR 50.36, "Technical specifications," provides: (1) Safety limits, limiting safety system settings, and limiting control settings, (2) Limiting conditions for operation, (3) Surveillance requirements, (4) Design Features, (5) Administrative controls, (6) Decommissioning, (7) Initial notification, and (8) Written Reports.

## 3.0 TECHNICAL EVALUATION

The technical review of the proposed the Cycle 21 COLR for MPS2 includes: (1) revision to page headers to reflect Cycle 21; (2) addition of a penalty factor to account for the impact of ICI detectors on the linear heat rate measurement; and (3) revision to Figure 2.5-1 based on the analysis supporting the offset ICI detectors.

### 3.1 Revision to Page Headers to Reflect Cycle 21

The NRC staff reviewed the proposed revision to page header to reflect Cycle 21 is acceptable because the revision is administrative in nature.

### 3.2 Addition of a Penalty Factor to Account for the Impact of Offset ICI Detectors on the Linear Heat Rate Measurement

MPS2 has a fixed ICI system. The ICI system consists of 45 arrays and each array consists of four levels of Rhodium detector segments with nominal positioning at 20%, 40%, 60%, and 80% of the core height. Within the core, the ICIs are located within Zircaloy thimble tubes. The thimble tubes are conduits which provide a means for quick removal and reinsertion of ICIs during refueling outages and for centering and cooling of the ICIs within them.

The industry has experienced radiation induced growth of Zircaloy instrument thimble tubes. Dominion contracted Westinghouse to replace the 45 instrument thimble tubes with tubes that are 10.5 inches shorter than the original design. The shorter replacement thimble tubes are necessary to ensure that the thimble tube do not contact the fuel assembly lower end fitting due to radiation induced growth at the end of plant life. The replacement of the thimble tubes took place during the fall 2009 refueling outage (2R19) with Cycle 20 being the first cycle of operation with the replaced thimble tubes.

During field fabrication of the replacement tubes in 2R19, Westinghouse cut 26 of the 45 thimble tubes shorter than intended by 1.375 inches. By design, the ICIs should be free hanging within the thimble tubes. However, the shortened thimble tubes raised the possibility that some of the ICI strings were bottomed out and slightly misaligned from the ideal location.

While some of the ICIs may still have been free hanging in the shortened thimble tubes, Dominion conservatively instructed AREVA to quantify the potential impact on the indications of core power distribution by assuming that 26 affected ICI strings were misaligned by the maximum amount of 1.375 inches. Any potential impacts were addressed in the AREVA cycle-specific setpoint analysis. For Cycle 20 operation, no change was needed to the acceptable operation regions in the COLR figures and the impact on $F_Q^N$ (or linear Heat Generation Rate (LHGR)) was accommodated within the known conservatism of the methodology because the total $F_Q^N$ uncertainty of 1.07 used for the Cycle 20 is higher than 1.0690 determined by AREVA in the letter dated May 1, 2012.

For Cycle 21 operation, a slight change in the Linear Heat Rate limiting condition for operation (LCO) monitoring tent (COLR Figure 2.5-1, used only when monitoring with excore detectors) and the use of a $F_Q^N$ penalty factor (used when monitoring with incore detectors) were needed to account for the maximum possible misalignment of the ICIs. An associated 1.0025 penalty factor was included in COLR Section 2.5 for Cycle 21.

The NRC staff reviewed the responses to the staff's request for additional information for the proposed MPS2 Cycle 21 COLR and summarized the staff's evaluation on the issues as follow:

1. Approved methodologies used to determine the linear heat rate measurement.

The MPS2 listed the approved methodology (Reference 1) used to validate the INPAX-II method using PRISM results. A detailed description of the INPAX-II method which converts measured signals to power distributions is given in Reference 2, which was cited for the use of INPAX-II for SAV95 application to one of incore monitoring of Combustion Engineering design plants that used fixed incore detectors similar to MPS2 design.

The NRC staff reviewed the methodology issue and found it acceptable because an approved methodology was used.

2. Methodology used to compute a penalty factor to account for the impact of the misaligned ICI detectors on the linear heat rate measurement.

The NRC-approved core simulator code PRISM (Reference 5) was used to generate predicted nodal power and activation rate information specific to the MPS2 Cycle 21 reactor core. Nodal power and activation rate information was generated at numerous axial points for each instrumented fuel assembly and at numerous times during core life.

The PRISM-generated activation information was used to generate pseudo-measured (or simulated) incore detector signals at both "nominal" and "offset" ICI detector conditions throughout core life. The "nominal" detector configurations were centered at the standard positions of core height. In the "offset" detector configuration, the 26 identified incore detectors were conservatively offset by the maximum amount of 1.375 inches. For each incore detector, a pseudo-measured signal was generated in the nominal and offset configurations, which was used to generate a nominal pseudo-measured 3-D power distribution (reconstructed nominal nodal power distribution) and an offset pseudo-measured 3-D power distribution (reconstructed offset nodal power distribution), respectively.

The relative difference between the reconstructed "nominal" and "offset" power distributions represents the potential error due to the misaligned detectors. This error was calculated for limiting reactor core locations which are instrumented. The maximum under-prediction difference for limiting measured locations during anytime in core life defines the maximum potential error due to the offset detectors. This maximum error was applied to the uncertainty calculated in Reference 5 and the amount over the TS measurement-calculational uncertainty factor was the additional penalty applied for this reload.

The TS measurement-calculational uncertainty factor for $F_Q^N$ (or LHGR) is 1.07 for the INPAX-II core monitoring system installed at MPS2. The additional penalty factor of 1.0025 provided in the letter dated January 18, 2012, will apply to peak measured $F_Q^N$, as determined by the INPAX-II core monitoring system, to account for the potential misaligned incore detectors.

The NRC staff reviewed the licensee's justification for using a conservative penalty factor of 1.0025 for $F_Q^N$ and found it acceptable due to the approved methodologies used.

3.3 Revision to Figure 2.5-1 Based on the Analysis Supporting the Offset ICI Detectors

The penalty factor of 1.0025 for the offset ICI detectors was applied to the setpoint verification calculations as a conservative bias on $F_Q^N$. The setpoint verification calculations were performed in accordance with AREVA Topical Report EMF-1961(P)(A), Statistical Setpoint/Transient Methodology for Combustion Engineering Type Reactors.

The operating region provided in Figure 2.5-1 of the Cycle 21 COLR was updated to provide adequate margin with the application of the penalty.

The NRC staff reviewed the licensee's justification for the conservative revised acceptable operating region shown in Figure 2.5-1 and found it acceptable because the updated operating region included penalty factor of 1.0025 for the offset ICI detectors.

In summary, the NRC staff concluded that the proposed COLR report for MPS2 Cycle 21 operation is acceptable.

## 4.0 CONCLUSION

The NRC staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

## 5.0 REFERENCES

1. EMF-96-029(P)(A) Volumes 1 and 2, "Reactor Analysis System for PWRs, Volume 1- Methodology Description, Volume 2 - Benchmarking Results," Siemens Power Corporation, January 1997.

2. XN-NF-83-01(P), "Exxon Nuclear Analysis of Power Distribution Measured Uncertainty for St. Lucie Unit 1, "Exxon Nuclear Company, January 1983.

Principal Contributor: THuang

Date: May 22, 2012

May 22, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Nuclear Connecticut, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION, UNIT NO. 2 - REVIEW OF THE CORE OPERATING LIMITS REPORT (COLR), CYCLE 21 (TAC NO. ME6365)

Dear Mr. Heacock:

By letter dated May 19, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11152A148), Dominion Nuclear Connecticut, Inc. (DNC) submitted the Millstone Power Station, Unit 2 (MPS2) Cycle 21 Core Operating Limits Report (COLR) in accordance with Technical Specification (TS) Section 6.9.1.8.d. DNC provided additional information regarding the COLR by letters dated November 30, 2011 (ML11342A122), January 18, 2012 (ML12025A225), and May 1, 2012 (ML12129A200).

The U.S. Nuclear Regulatory Commission (NRC) staff has completed its review of the report and concludes that the revision to the Cycle 21 COLR is acceptable for MPS2 Cycle 21 operation. The NRC staff's safety evaluation of the report is enclosed.

Please contact me at (301) 415-4125 if you have any questions on this issue.

Sincerely,
***/ra/***

James Kim, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-336

Enclosure:
As stated

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**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
**REGION I**
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

June 4, 2012

EA-12-087

David A. Heacock
President and Chief Nuclear Officer
Dominion Nuclear Connecticut, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060

SUBJECT: NRC INVESTIGATION REPORT NO. 1-2012-015

Dear Mr. Heacock:

This letter refers to the investigation by the U. S. Nuclear Regulatory Commission (NRC) Office of Investigations (OI) conducted at the Millstone Nuclear Power Station (MNPS), which was completed on April 18, 2012. The investigation was conducted to determine whether a contract employee previously employed as a security officer at MNPS, deliberately failed to report an April 2, 2011, arrest on the employee's first day back to work following the arrest. The OI investigation was initiated after MNPS identified this failure, entered it into its Corrective Action Program, and informed the NRC resident inspectors at MNPS.

Based on the evidence gathered during the OI investigation, including the contractor's admission to OI that she knew she should have promptly reported the arrest but did not, the NRC has concluded that the contractor did, in fact, deliberately violate the reporting requirements set forth in 10 CFR 73.56(g). This regulation specifies, in part, that any individual maintaining unescorted access (UA) shall promptly report to the reviewing official, his or her supervisor, or other management personnel designated in site procedures any legal action taken by a law enforcement authority to which the individual has been subject that could result in incarceration or a court order that requires a court appearance, including an arrest.

In this case, on April 2, 2011, the contractor, who had UA to MNPS at the time, was arrested while offsite and during non-working hours. Although the contractor should have promptly reported the arrest to MNPS on the first day back to work following the arrest, the contractor continued working at MNPS without reporting the arrest until December 9, 2011. At that time, the contractor included the arrest on a personal history questionnaire provided to MNPS as part of its five-year re-investigation to maintain the contractor's UA. As a result, MNPS removed the contractor's UA, terminated the contractor's employment, and updated the individual's Personal Access Data System entry to reflect the unfavorable termination.

After reviewing the specific circumstances regarding this issue, the NRC is not taking any enforcement action against MNPS.

You are not required to respond to this letter. However, should you choose to respond, your response should be sent to the U.S. Nuclear Regulatory Commission, ATTN: Regional Administrator, Region I, 2100 Renaissance Boulevard, Suite 100, King of Prussia, PA 19406, and marked "Open by Addressee Only," within 30 days of the date of this letter, with a copy to the NRC Senior Resident Inspector at MNPS.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room and from the NRC's Agency-wide Documents Access and Management System (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. Should you have any questions regarding this letter, please contact Mr. Ronald Bellamy at 610-337-5200.

Sincerely,

**/RA/**

Darrell J. Roberts, Director
Division of Reactor Projects

Docket No. 50-245; 50-336
License No. DPR-21; DPR-65

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You are not required to respond to this letter. However, should you chose to respond, your response should be sent to the U.S. Nuclear Regulatory Commission, ATTN: Regional Administrator, Region I, 2100 Renaissance Boulevard, Suite 100, King of Prussia, PA 19406, and marked "Open by Addressee Only," within 30 days of the date of this letter, with a copy to the NRC Senior Resident Inspector at MNPS.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room and from the NRC's Agency-wide Documents Access and Management System (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. Should you have any questions regarding this letter, please contact Mr. Ronald Bellamy at 610-337-5200.

Sincerely,
**/RA/**
Darrell J. Roberts, Director
Division of Reactor Projects

Docket No. 50-245; 50-336
License No. DPR-21; DPR-65

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OFFICIAL RECORD

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 7, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Nuclear Connecticut, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION, UNITS 2 AND 3 - REVIEW OF 60 DAY RESPONSE TO REQUEST FOR INFORMATION REGARDING RECOMMENDATION 9.3, OF THE NEAR-TERM TASK FORCE RELATED TO THE FUKUSHIMA DAIICHI NUCLEAR POWER PLANT ACCIDENT (TAC NOS. ME8645 AND ME8646)

Dear Mr. Heacock:

By letter dated March 12, 2012, the U.S. Nuclear Regulatory Commission (NRC or Commission) issued a Request for Information pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.54(f) which included the Near Term Task Force (NTTF) Recommendation 9.3 for Emergency Preparedness (EP). Specifically, licensees were requested to assess their means to power communications equipment onsite and offsite during a prolonged Station Blackout (SBO) event and to perform a staffing study to determine the staff required to fill all necessary positions in response to a multi-unit event. If a licensee could not meet the requested 90-day response, then that licensee was required to provide a response within 60 days of the issuance of the letter describing an alternative course of action and estimated completion date.

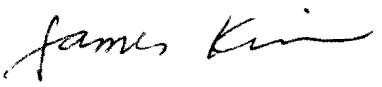
By letter dated May 9, 2012, Millstone Power Station Units 2 and 3 submitted its 60-day response proposing an alternative course of action based upon the higher priority to complete the implementation of the revised EP Rule. As discussed in the enclosed NRC staff evaluation, the licensee's alternative approach outlined in its 60-day response letter is consistent with the guidance of industry document Nuclear Energy Institute (NEI) 12-01, "Guidance for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities,"[1] and the direction of the Commission.

In addition, the NRC staff concludes that the licensee provided an adequate basis for its proposed alternative to responding to the 50.54(f) Request for Information regarding communications and staffing for NTTF Recommendation 9.3.

[1] NRC staff determined NEI 12-01 to be an acceptable approach in letter dated May 15, 2012 (ADAMS Accession No. ML12131A043).

If you have any questions regarding this letter, please feel free to contact the project manager James Kim at (301) 415-4125 or via email at James.Kim@nrc.gov.

Sincerely,



James Kim, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-336 and 50-423

Enclosure:
Staff Evaluation

cc: Distribution via Listserv

NUCLEAR REGULATORY COMMISSION STAFF EVALUATION

INFORMATION REQUEST MADE UNDER 10 CFR 50.54(f)

REGARDING NEAR-TERM TASK FORCE RECOMMENDATION 9.3

DOMINION NUCLEAR CONNECTICUT, INC.

MILLSTONE POWER STATION, UNITS 2 AND 3

DOCKET NOS. 50-336 AND 50-423

By letter dated March 12, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12073A348), the U.S. Nuclear Regulatory Commission (NRC or Commission) issued a Request for Information pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), paragraph 50.54(f) which included the Near-Term Task Force (NTTF) Recommendation 9.3 for Emergency Preparedness (EP). Specifically, licensees were requested to assess their means to power communications equipment onsite and offsite during a prolonged Station Blackout (SBO) event and to perform a staffing study to determine the staff required to fill all necessary positions in response to a multi-unit event. If a licensee could not meet the requested 90-day response, then that licensee was required to provide a response within 60 days of the issuance of the letter describing an alternative course of action and estimated completion date.

By letter dated May 3, 2012 (ADAMS Accession No. ML12125A410), the Nuclear Energy Institute (NEI) submitted NEI 12-01, "Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities," Revision 0, May 2012. The NRC staff reviewed NEI 12-01 and found it to be an acceptable method for licensees to use when responding to the NRC's 10 CFR 50.54(f) Request for Information regarding communications and staffing for EP. This staff evaluation is focused specifically on the licensee's response to the 10 CFR 50.54(f) letters and not on the associated Orders.

By letter dated May 9, 2012 (ADAMS Accession No. ML12132A376), Millstone Power Station Units 2 and 3 submitted its 60-day response to the 10 CFR 50.54(f) Request for Information proposing an alternative course of action based upon the higher priority to complete the implementation of the revised EP Rule. The NRC staff reviewed the licensee's proposed alternative against the guidance contained in NEI 12-01. In addition, the NRC staff also considered the direction given by the Commission in the Staff Requirements Memorandum to SECY 12-0025, "Proposed Orders and Requests for Information in Response to Lessons Learned from Japan's March 11, 2011, Great Tohoku Earthquake and Tsunami," dated March 9, 2012 (ADAMS Accession No. ML120690347). This guidance stated, in part, that

> Completing implementation activities associated with the rule we have already promulgated has greater safety significance and also involves the coordinated actions of our partners in State and local governments. Substantial public credibility benefits accrue from continuing these activities as a priority.

The NRC staff considers the existing EP framework and regulations provides reasonable assurance of adequate protection of public health and safety in the event of a radiological emergency. The revised EP rule that was promulgated on November 23, 2011, initiated a number of activities that will enhance EP programs, including conducting a staffing analysis and enhancing public notification systems. The implementation of the EP rule was given priority by the Commission and the NTTF recommendations should not displace ongoing work that has greater safety benefit, higher priority, or is necessary for continued safe operation of nuclear power plants. The NTTF Report concluded that continued operation and continued licensing activities do not pose an imminent risk to the public health and safety and are not inimical to the common defense and security.

The phased approach to responding to the 10 CFR 50.54(f) letters, combined with the definition of new response requirements associated with Fukushima NTTF Recommendation 4.2, as subsequently modified by the NRC staff and issued as NRC Order EA-12-049 (ADAMS Accession No. ML12054A736), will ensure that enhancements will be made to staffing and communications by licensees. It should be noted that the 10 CFR 50.54(f) letter and implementation of the Order includes completion of actions related to response assignments, staffing changes, issuance of new or revised procedures or guidelines, and training. Activities are ongoing by both the NRC and industry to initiate interim actions as a result of lessons learned from the events which will be provided in the 90-day response such as:

- Methods to access the site
- Notification of staff
- Interim actions taken to date

Given the above and that the licensee's approach was found to be consistent with the guidance of NEI 12-01 and the direction of the Commission, the NRC staff concludes that the licensee has provided an adequate basis for its proposed alternative responding to the 10 CFR 50.54(f) letters regarding communications and staffing for Recommendation 9.3.

If you have any questions regarding this letter, please feel free to contact the project manager James Kim at (301) 415-4125 or via email at James.Kim@nrc.gov.

Sincerely,

/RA/

James Kim, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-336 and 50-423

Enclosure:
Staff Evaluation

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|---|---|---|---|
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| DATE | 6/6/12 | 6/5/12 | 5/24/12 |
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| NAME | RPascarelli | GWilson (DPickett for) | JKim |
| DATE | 6/6/12 | 6/7/12 | 6/7/12 |

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 15, 2012

Mr. Dale A. Rocheleau
Senior Vice President, General Counsel
& Corporate Secretary
Central Vermont Public Service Corporation
77 Grove St.
Rutland, VT 05701

SUBJECT: ORDER APPROVING APPLICATION REGARDING MERGER OF CENTRAL VERMONT PUBLIC SERVICE CORPORATION AND GAZ MÉTRO LIMITED PARTNERSHIP AND RESULTANT INDIRECT TRANSFER OF LICENSE (TAC NO. ME7127)

Dear Mr. Rocheleau:

The Nuclear Regulatory Commission (NRC) has completed its review of the application dated September 9, 2011, as supplemented by letters dated on November 4, 2011, April 6, 2012, and May 4, 2012, requesting the NRC's consent to the indirect transfer of control of Central Vermont Public Service Corporation (CVPS)' 1.7303% interest in the license for Millstone Power Station, Unit 3 (MPS3), resulting from the acquisition of CVPS by Gaz Métro Limited Partnership (Gaz Métro).

According to the application, CVPS also owns 2% of the outstanding common stock of Maine Yankee Atomic Power Company, 2% of the outstanding common stock of Connecticut Yankee Atomic Power Company, and 3.5% of the outstanding common stock of Yankee Atomic Electric Company (collectively, the "Yankee Companies"), which will be transferred due to the merger. CVPS and Gaz Métro request that the NRC staff make a threshold determination that the above requested license transfer transaction does not involve any direct or indirect transfer of control of the NRC licenses held by the Yankee Companies, pursuant to 10 CFR 50.80.

Enclosure 1 is the Order approving the proposed indirect ownership transfers resulting from the acquisition of CVPS by Gaz Métro under Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.80, "Transfer of licenses." The Order is subject to the conditions described therein.

Enclosure 2 contains the NRC staff's safety evaluation related to the indirect transfer of the MPS3 license.

Enclosure 3 is the NRC staff's evaluation of the indirect transfer of the Yankee Companies licenses and no threshold finding.

The Order has been forwarded to the Office of the Federal Register for publication.

Sincerely,

James Kim

James Kim, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-423

Enclosures:
1. Order
2. Safety Evaluation
3. No Threshold Evaluation

cc w/encls: Daniel F. Stenger
Hogan Lovells US LLP
555 Thirteenth Street, NW
Washington, DC 20004

Thomas L. Cubbage, III
Covington & Burling LLP
1201 Pennsylvania Avenue, NW
Washington, DC 20004

Additional distribution via Listserv

7590-01-P

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

| | | |
|---|---|---|
| In the Matter of | ) | |
| | ) | |
| CENTRAL VERMONT PUBLIC SERVICE CORPORATION | ) | |
| | ) | |
| GAZ MÉTRO LIMITED PARTNERSHIP | ) | |
| | ) | |
| DOMINION NUCLEAR CONNECTICUT, INC. | ) | |
| | ) | |
| (Millstone Power Station, Unit 3) | ) | Docket No. 50-423 |

ORDER APPROVING APPLICATION REGARDING PROPOSED MERGER OF CENTRAL VERMONT PUBLIC SERVICE CORPORATION AND GAZ MÉTRO LIMITED PARTNERSHIP AND INDIRECT TRANSFER OF LICENSE

I.

Dominion Nuclear Connecticut, Inc. (DNC or the licensee) is authorized to act as the agent for the joint owners of the Millstone Power Station, Unit 3 (MPS3), and has exclusive responsibility and control over the physical construction, operation, and maintenance of the facility as reflected in the Renewed Facility Operating License No. NPF-49. Central Vermont Public Service Corporation (CVPS), one of the joint owners, holds a 1.7303% minority interest in MPS3. MPS3 is located in the town of Waterford, Connecticut.

II.

By letter dated September 9, 2011, as supplemented on November 4, 2011, April 6, 2012, and May 4, 2012 (collectively, the application), CVPS and Gaz Métro Limited Partnership (Gaz Métro) submitted an application requesting that the Nuclear Regulatory Commission (NRC) consent, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section

50.80, to the indirect transfer of control of the operating license for MPS3 to the extent held by CVPS, resulting from the acquisition of CVPS by Gaz Métro.

The application states that on July 11, 2011, CVPS, Gaz Métro, and Danaus Vermont Corp., an independent wholly owned subsidiary of Gaz Métro formed as a merger subsidiary, entered into an Agreement and Plan of Merger. The merger agreement provides that Danaus Vermont Corp. will merge with and into CVPS, with CVPS continuing as the surviving corporation and an indirect wholly owned subsidiary of Gaz Métro. As a result of the transaction, CVPS will become a direct subsidiary of Northern New England Energy Corporation, a Gaz Métro subsidiary and holding company organized and existing under the laws of the State of Vermont and formed to own Gaz Métro's energy-company investments in the United States.

According to the application, CVPS is a Vermont corporation and the largest electric utility in Vermont. Gaz Métro is a Canadian energy company. The merger of Gaz Métro with CVPS will result in the indirect transfer of control of CVPS' 1.7303% interest in the license for MPS3. The principal owner and operator of MPS3 is DNC, which owns 93.4707%. The remaining 4.7990% of the license is owned by Massachusetts Municipal Wholesale Electric Company. This transfer does not affect Massachusetts Municipal Wholesale Electric Company's ownership or DNC's ownership and operation of the facility.

No physical changes to the MPS3 facility or operational changes are being proposed in the application.

Notice of the request for approval and opportunity for a hearing was published in the *Federal Register* on February 27, 2012 (77 FR 11596). No comments or hearing requests were received.

Pursuant to 10 CFR 50.80, no license, or any right thereunder, shall be transferred, directly or indirectly, through transfer of control of the license, unless the Commission shall give its consent in writing. Upon review of the information in the application as supplemented and other information before the Commission, and relying upon the representations and agreements in the application, the NRC staff has determined that the proposed merger between CVPS and Gaz Métro, as described in the application, will not affect the qualifications of DNC as a holder of the Renewed Facility Operating License No. NPF-49, and that the indirect transfer of the license, to the extent effected by the proposed acquisition, is otherwise consistent with applicable provisions of law, regulations, and Orders issued by the Commission, pursuant thereto, subject to the conditions set forth herein. The foregoing findings are supported by a safety evaluation (SE) dated June 15, 2012.

III.

Accordingly, pursuant to Sections 161b, 161i, 161o, and 184 of the Atomic Energy Act of 1954, as amended (the Act), 42 U.S.C. Sections 2201(b), 2201(i), 2201(o), and 2234; and 10 CFR 50.80, IT IS HEREBY ORDERED that the application regarding the indirect license transfers related to the proposed corporate merger, as described herein, is approved, subject to the following conditions:

1. The Negation Action Plan provided to the NRC for review on April 6, 2012 may not be modified in any respect concerning decision-making authority over "safety issues" as defined therein without the prior written consent of the Director, Office of Nuclear Reactor Regulation.
2. At least half the members of CVPS' Board of Directors shall be U.S. citizens.

3. The Chief Executive Officer (CEO), Chief Nuclear Officer (CNO) and Chairman of the Board of Directors of CVPS shall be U.S. citizens. These individuals shall have the responsibility and exclusive authority to ensure and shall ensure that the business and activities of CVPS with respect to the MPS3 license is at all times conducted in a manner consistent with the public health and safety and common defense and security of the United States.
4. The CVPS Board of Directors will establish a Special Nuclear Committee (SNC) composed of U.S. citizens, a majority of whom are not officers, directors, or employees of CVPS, Gaz Métro, or any Gaz Métro subsidiaries. The SNC will report to the CVPS Board of Directors on a quarterly basis for informational purposes. The SNC will make available to the NRC for review these and any other reports regarding foreign ownership and control of nuclear operations.
5. Should the proposed corporate merger not be completed within 1 year from the date of this Order, this Order shall become null and void, provided, however, upon written application and good cause shown, such date may be extended by Order.

This Order is effective upon issuance.

For further details with respect to this Order, see the initial application dated September 9, 2011 (Agencywide Documents Access and Management System Accession No. ML11256A051), as supplemented by letters dated November 4, 2011 (ML11311A148), April 6, 2012 (ML12100A017), and May 4, 2012 (ML12128A433) and the SE dated June 15, 2012, which are available for public inspection at the Commission's Public Document Room (PDR), located at One White Flint North, Public File Area 01 F21, 11555 Rockville Pike (first

floor), Rockville, MD. Publicly available documents created or received at the NRC are accessible electronically through ADAMS in the NRC Library at http://www.nrc.gov/reading-rm/adams.html. Persons who do not have access to ADAMS, or who encounter problems in accessing the documents located in ADAMS, should contact the NRC PDR reference staff by telephone at 1-800-397-4209 or 301-415-4737, or by e-mail to pdr.resource@nrc.gov.

Dated at Rockville, Maryland, this 15th day of June 2012.

FOR THE NUCLEAR REGULATORY COMMISSION

Louise Lund

Louise Lund, Acting Director
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
**WASHINGTON, D.C. 20555-0001**

# SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

# APPLICATION FOR THE INDIRECT TRANSFER OF CONTROL

# 1.7303% INTEREST IN THE LICENSE FOR

# MILLSTONE POWER STATION, UNIT 3; DOCKET NO. 50-423

# FROM CENTRAL VERMONT PUBLIC SERVICE CORPORATION

# TO GAZ MÉTRO LIMITED PARTNERSHIP

## 1.0 INTRODUCTION

By application dated September 9, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11256A051), as supplemented by letters dated November 4, 2011 (ML11311A148), April 6, 2012 (ML12100A017), and May 4, 2012 (ML12128A433), (collectively, "the application"), Central Vermont Public Service Corporation (CVPS) and Gaz Métro Limited Partnership (Gaz Métro) requested that the U.S. Nuclear Regulatory Commission (NRC) consent, pursuant to Title 10 of the *Code of Federal Regulation* (10 CFR), Section 50.80, to the indirect transfer of control of CVPS' 1.7303% interest in the license for Millstone Power Station, Unit 3 (MPS 3), resulting from the acquisition of CVPS by Gaz Métro.

The application also requests that the NRC conduct a threshold determination to determine whether the proposed transfer of CVPS' interests in Maine Yankee Atomic Power Company, Connecticut Yankee Atomic Power Company, and Yankee Atomic Electric Company to Gaz Métro would constitute a direct or indirect transfer of the licenses that would require NRC approval pursuant to 10 CFR 50.80. That matter will be reviewed in a separate safety evaluation.

The letters of April 6, 2012 and May 4, 2012 contained clarifying information and did not expand the scope of the original *Federal Register* notice of February 27, 2012 (77 FR 11596).

## 2.0 BACKGROUND

The application states that on July 11, 2011, CVPS, Gaz Métro, and Danaus Vermont Corp., an independent wholly owned subsidiary of Gaz Métro formed as a merger subsidiary, entered into an Agreement and Plan of Merger. The merger agreement provides that Danaus Vermont Corp. will merge with and into CVPS, with CVPS continuing as the surviving corporation and an indirect wholly owned subsidiary of Gaz Métro. As a result of the transaction, CVPS will

become a direct subsidiary of Northern New England Energy Corporation, a Gaz Métro subsidiary and holding company organized and existing under the laws of the State of Vermont and formed to own Gaz Métro's energy company investments in the United States.

According to the application, CVPS is a Vermont corporation and the largest electric utility in Vermont. CVPS engages in the purchase, production, transmission, distribution and sale of electricity.

According to the application, Gaz Métro is a Canadian energy company and Quebec's leading natural gas distributor with over $3.6 billion in assets. Gaz Métro has operated since 1957 and is an energy provider to its customers in Quebec and through its existing U.S. subsidiaries in Vermont. Gaz Métro is also involved in electricity distribution, natural gas transportation and storage, and the development of projects such as wind power.

The merger of Gaz Métro with CVPS will result in the indirect transfer of control of CVPS' 1.7303% interest in the license for MPS3. MPS3 is a 1227 MWe pressurized-water reactor, located approximately 3 miles WSW of New London, Connecticut in Waterford, Connecticut. The principal owner and operator of MPS3 is Dominion Nuclear Connecticut Inc., which owns 93.4707%. The remaining 4.7990% of the license is owned by Massachusetts Municipal Wholesale Electric Company.

## 3.0 REGULATORY EVALUATION

The applicant's request for approval of the indirect transfer of the license listed above and discussed in this Safety Evaluation is made pursuant to 10 CFR 50.80. Section 50.80(a) of 10 CFR states:

> No license for a production or utilization facility, or any right thereunder, shall be transferred, assigned, or in any manner disposed of, either voluntarily or involuntarily, directly or indirectly, through transfer of control of the license to any person, unless the Commission gives its consent in writing.

In addition, the requirements of 10 CFR 50.80(b) and (c) apply. Section 50.80(b) states than an application for a license transfer shall include as much information described in 10 CFR 50.33 and 10 CFR 50.34 "with respect to the identity and technical and financial qualifications of the proposed transferee as would be required by those sections if the applications were for an initial license." Section 50.80(c) states that:

> [T]he Commission will approve an application for the transfer of a license, if the Commission determines: (1) That the proposed transferee is qualified to be the holder of the license; and (2) That transfer of the license is otherwise consistent with applicable provisions of law, regulations, and orders issued by the Commission pursuant thereto.

For indirect license transfers, the Commission has held, with respect to the first determination, that it will approve an application if the Commission determines that the proposed indirect transfer of control of the license will not affect the qualifications of the licensee to hold the license.

## 4.0 FINANCIAL QUALIFICATIONS

The regulation at 10 CFR 50.33(f) provides that each application shall state the following:

> Except for an electric utility applicant for a license to operate a utilization facility of the type described in § 50.21(b) or § 50.22, information sufficient to demonstrate to the Commission the financial qualification of the applicant to carry out, in accordance with regulations in this chapter, the activities for which the permit or license is sought.

The regulation at 10 CFR 50.2, "Definitions," states, in part, that an electric utility is:

> Any entity that generates or distributes electricity and which recovers the cost of this electricity, either directly or indirectly, through rates established by the entity itself or by a separate regulatory authority.

Based upon information provided in the application, the staff finds that, according to the definition in 10 CFR 50.2, CVPS is a utility and will remain a utility after consummation of the proposed merger with Gaz Métro. As such, pursuant to 10 CFR 50.33(f), a review of financial qualifications is not warranted in this evaluation.

## 5.0 DECOMMISSIONING FUNDING

The NRC has determined that the requirements to provide reasonable assurance of decommissioning funding are necessary to ensure the adequate protection of public health and safety. The regulation at 10 CFR 50.33(k) requires that an application for an operating license for a utilization facility shall state information indicating how reasonable assurance will be provided and that funds will be available to decommission the facility.

The regulation at 10 CFR 50.75(b) requires the following:

> Each power reactor applicant for or holder of an operating license...for a production or utilization facility of the type and power level specified in paragraph (c) of this section shall submit a decommissioning report, as required by § 50.33(k).

In accordance with 10 CFR 50.75(f)(1), CVPS reported information on the status of decommissioning funding for MPS3 as of December 31, 2010, to the NRC in the decommissioning funding status (DFS) report dated March 29, 2011 (ML110900375), and supplemented by letter dated June 14, 2011 (ML111810155). The NRC staff documented its review of the operating plants' DFS reports in SECY-11-0149, "Summary Findings Resulting from the Staff Review of the 2010 Decommissioning Funding Status Reports for Operating Power Reactor Licensees," dated October 26, 2011 (ML112620046).

According to the application and the DFS report for MPS3 dated March 29, 2011, CVPS' minimum financial assurance obligation as of December 31, 2010 was $8.3 million, which represents its 1.7303% pro rata share of the total NRC minimum financial assurance amount, pursuant to 10 CFR 50.75(b) and (c), of $482 million, CVPS also indicated that the value of its funds held in external decommissioning trusts as of December 31, 2010 was $5.7 million.

The NRC staff verified the calculations provided by the applicant in the aforementioned DFS report for MPS3 as of December 31, 2010. Based on its review of the 2010 DFS report, the NRC staff determined that adequate decommissioning funding assurance was provided for MPS3 in accordance with NRC regulations.

Additionally, according to the application, the proposed transaction will not affect CVPS' current decommissioning funding arrangements, which requires it to be responsible for its pro rata share of the nuclear decommissioning funding assurance obligation for MPS3. CVPS will continue to provide financial assurance for the decommissioning of MPS3 in accordance with 10 CFR 50.75.

Based on the discussion above, the NRC staff concludes that CVPS has complied with the requirements of 10 CFR 50.75 with respect to providing decommissioning funding assurance for MPS3 and that the proposed merger will not affect its ability to provide decommissioning funding assurance in the future.

## 6.0 TECHNICAL QUALIFICATIONS

As stated in the application dated September 9, 2011, CVPS does not have any operating authority under the NRC operating license for MPS3. Accordingly, the technical qualifications of CVPS will not be reviewed in this safety evaluation. In any event, the transactions will have no impact on the operation, management, or control of any licensed facility, and no changes in any licensed activities have been proposed.

## 7.0 ANTITRUST REVIEW

The Atomic Energy Act of 1954, as amended (AEA), does not require or authorize antitrust reviews of post-operating license transfer applications. *Kansas Gas and Electric Co., et al.* (Wolf Creek Generating Station, Unit 1), CLI-99-19, 49 NRC 441 (1999). The application here postdates the issuance of the operating licenses for the units under consideration in this Safety Evaluation and, therefore, no antitrust review is required or authorized. The subject license does not contain any antitrust conditions. Therefore, there are no antitrust issues to be considered in connection with the conforming license amendments.

## 8.0 FOREIGN OWNERSHIP, CONTROL, OR DOMINATION

Sections 103d and 104d of the AEA provide, in relevant part, that no license may be issued to:

> Any corporation or other entity if the Commission knows or has reason to believe it is owned, controlled, or dominated by an alien, a foreign corporation or a foreign government. In any event, no license may be issued to any person within the United States if, in the opinion of the Commission, the issue of a license to such person would be inimical to the common defense and security or to the health and safety of the public.

The NRC's regulation at 10 CFR 50.38, "Ineligibility of certain applicants," is the regulatory provision that implements the statute. The NRC evaluated the application in a manner that is consistent with the guidance provided in the Standard Review Plan, "Foreign Ownership, Control, or Domination of Applicants for Reactor Licenses," dated June 1999, (hereafter referred

to as the "SRP on FOCD"), to determine whether the applicant is owned, controlled, or dominated by an alien, a foreign corporation, or a foreign government. (64 FR 52357-52359)

The NRC's Position outlined in the SRP on FOCD states that "the foreign control prohibition should be given an orientation toward safeguarding the national defense and security." Further, the SRP on FOCD outlines how the effects of foreign ownership may be mitigated through implementation of a "negation action plan" to ensure that any foreign interest is effectively denied control or domination over the licensee.

As previously stated, the proposed merger will result in Canadian limited partnership Gaz Métro, through a U.S. subsidiary, Northern New England Energy Corporation, holding a 100% ownership interest in CVPS. The applicant states that, because CVPS owns only a minority non-operational interest in MPS3, it is not expected that Gaz Métro, as an indirect foreign parent company of CVPS, will be able to exercise foreign control or domination within the meaning of the AEA and 10 CFR 50.38 over the subject license. However, in an abundance of caution, CVPS states that it is implementing, no later than the closing of the proposed merger, a Negation Action Plan (NAP) to ensure that any potential foreign control or domination is fully negated.

The application further states that the NAP is designed to assure continued U.S. control with respect to all matters related to CVPS' nuclear ownership interests required to be under U.S. control by the AEA and NRC regulations. The NAP provides for the establishment of a Special Nuclear Committee (Committee) of the CVPS Board of Directors. The Committee will consist of three CVPS Board members who are U.S. citizens, with a majority of the Committee's members being independent directors. The provisions of the NAP will be reflected in CVPS' amended Bylaws, which will be submitted to the NRC when they become available.

The NRC staff reviewed the information provided in the application regarding FOCD matters, including the NAP and additional information provided in a letter dated April 6, 2012 (Accession No. ML12100A017). Based on this review and the implementation of the NAP as reviewed, the staff finds that the licensee will not be foreign owned, controlled, or dominated, if the following conditions are imposed:

(a) The Negation Action Plan provided to the NRC on April 6, 2012 for review may not be modified in any respect concerning decision-making authority over "safety issues" as defined therein without the prior written consent of the Director, Office of Nuclear Reactor Regulation.

(b) At least half the members of CVPS' Board of Directors shall be U.S. citizens.

(c) The Chief Executive Officer (CEO), Chief Nuclear Officer (CNO) and Chairman of the Board of Directors of CVPS shall be U.S. citizens. These individuals shall have the responsibility and exclusive authority to ensure and shall ensure that the business and activities of CVPS with respect to the MPS3 license is at all times conducted in a manner consistent with the public health and safety and common defense and security of the United States.

(d) The CVPS Board of Directors will establish a Special Nuclear Committee (SNC) composed only of U.S. citizens, a majority of whom are not officers, directors, or employees of CVPS, Gaz Métro, or any other Gaz Métro subsidiaries. The SNC will report to the CVPS Board of Directors on a quarterly basis for informational purposes. The SNC will make available to the NRC for review these and any other reports regarding foreign ownership and control of nuclear operations.

## 9.0 NUCLEAR INSURANCE & INDEMNITY

According to the application, the proposed indirect transfer of control of the license would not affect the existing Price-Anderson indemnity agreements and the required nuclear property damage insurance under 10 CFR 50.54(w) and nuclear energy liability insurance required under Section 1770 of the AEA and 10 CFR Part 140, "Financial Protection Requirements and Indemnity Agreements."

Also, the NRC has no reason to believe that the proposed merger will affect the ability of CVPS to meet its financial obligation for its pro rata share of obligations for retrospective premiums for MPS3.

Therefore, in consideration of the foregoing, the NRC concludes that the indirect transfer of control of the license held by CVPS for MPS3 will have no adverse impact on its ability to provide required nuclear insurance and indemnity coverage and its ability to meet its nuclear insurance obligations.

## 10.0 CONCLUSION

In view of the foregoing, the NRC staff finds that the proposed merger between CVPS and Gaz Métro will not affect the qualifications of CVPS to hold the license for the MPS3 under review herein, and that the indirect transfer of the license to the extent held by CVPS is otherwise consistent with applicable provisions of law, regulations, and orders issued by the Commission pursuant thereto, subject to the conditions set forth above.

Principal Contributor: Shawn Harwell

Date: June 15, 2012

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 15, 2012

Mr. Dale A. Rocheleau
Senior Vice President, General Counsel
& Corporate Secretary
Central Vermont Public Service Corporation
77 Grove St.
Rutland, VT 05701

SUBJECT: REQUEST FOR THRESHOLD DETERMINATION UNDER 10 CFR 50.80 - THE PROPOSED MERGER BETWEEN CVPS AND GAZ MÉTRO INVOLVING MINORITY COMMON STOCK OWNERSHIP IN MAINE YANKEE ATOMIC COMPANY, CONNECTICUT YANKEE ATOMIC COMPANY, AND YANKEE ATOMIC ELECTRIC COMPANY (TAC NO. ME7127)

Dear Mr. Rocheleau:

By application dated September 9, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11256A051), Central Vermont Public Service Corporation (CVPS) and Gaz Métro Limited Partnership (Gaz Métro) notified the U.S. Nuclear Regulatory Commission (NRC) of a proposed merger between the two companies that would result in a transfer of interests involving NRC licensed facilities. The Application requested that the NRC staff make a threshold determination that the proposed transfer of CVPS' interests in Maine Yankee Atomic Power Company (Maine Yankee), Connecticut Yankee Atomic Power Company (Connecticut Yankee), and Yankee Atomic Electric Company (Yankee Atomic) (collectively, the "Yankee Companies") to Gaz Métro would not constitute a direct or indirect transfer of the licenses that would require NRC approval pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) CFR 50.80, "Transfer of licenses."

The NRC staff completed its review of the facts and information as set forth in the application, and concludes that the proposed merger between CVPS and Gaz Métro will not constitute a direct or indirect transfer of control of the Maine Yankee, Connecticut Yankee or Yankee Atomic licenses. Therefore, neither Maine Yankee, Connecticut Yankee, nor Yankee Atomic require the NRC's approval under Section 184 of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.80, with respect to the licenses currently held by them in connection with the proposed merger between CVPS and Gaz Metro.

Enclosure 3

Please contact James Kim at 310-415-4125 if you have any questions.

Sincerely,

Louise Lund

Louise Lund, Acting Director
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-423

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

# SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

# REQUEST FOR THRESHOLD DETERMINATION OF THE PROPOSED MERGER BETWEEN CVPS AND GAZ MÉTRO INVOLVING MINORITY COMMON STOCK OWNERSHIP IN MAINE YANKEE ATOMIC COMPANY, CONNECTICUT YANKEE ATOMIC COMPANY, AND YANKEE ATOMIC ELECTRIC COMPANY

# DOCKET NOS. 50-309, 72-30; 50-213, 72-39; 50-029; 72-31

## 1.0 INTRODUCTION

By application dated September 9, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11256A051), Central Vermont Public Service Corporation (CVPS) and Gaz Métro Limited Partnership (Gaz Métro) notified the U.S. Nuclear Regulatory Commission (NRC) of a proposed merger between the two companies that would result in a transfer of interests involving NRC licensed facilities. The application requested that the NRC make a threshold determination whether a proposed transfer of CVPS' interests in Maine Yankee Atomic Power Company (Maine Yankee), Connecticut Yankee Atomic Power Company (Connecticut Yankee), and Yankee Atomic Electric Company (Yankee Atomic) (collectively, the "Yankee Companies) to Gaz Métro would constitute a direct or indirect transfer of the licenses that would require NRC approval pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) CFR 50.80, "Transfer of licenses."

## 2.0 BACKGROUND

By application dated September 9, 2011 (ML11256A051), as supplemented by letters dated November 4, 2011 (ML11311A148), April 6, 2012 (ML12100A017), and May 4, 2012 (ML12128A433), (collectively, "the application"), Central Vermont Public Service Corporation (CVPS) and Gaz Métro Limited Partnership (Gaz Métro) requested that the U.S. Nuclear Regulatory Commission (NRC) consent, pursuant to 10 CFR 50.80, to the indirect transfer of control of CVPS' 1.7303% interest in the license for Millstone Power Station, Unit 3 (MPS 3), resulting from the acquisition of CVPS by Gaz Métro.

According to the application, CVPS also owns, through equity investment, 2% of the outstanding common stock of Maine Yankee Atomic Power Company, 2% of the outstanding common stock of Connecticut Yankee Atomic Power Company, and 3.5% of the outstanding common stock of Yankee Atomic Electric Company (collectively, the "Yankee Companies"). CVPS and Gaz Métro requested that the NRC staff make a threshold determination that the above requested license transfer transaction does not involve the direct or indirect transfer of control of the NRC licenses held by the Yankee Companies pursuant to 10 CFR 50.80.

CVPS is a Vermont corporation and the largest electric utility in Vermont. CVPS engages in the purchase, production, transmission, distribution and sale of electricity.

Gaz Métro is a Canadian energy company.

## 3.0 EVALUATION

The NRC staff reviewed the application submitted by CVPS and Gaz Métro in order to make a threshold determination on whether the proposed merger between CVPS and Gaz Métro would involve a direct or indirect control of the NRC licenses held by the Yankee Companies that would require approval pursuant to 10 CFR 50.80. The regulation at 10 CFR 50.80 states:

> No license for a production or utilization facility (including, but not limited to, permits under this part and part 52 of this chapter, and licenses under parts 50 and 52 of this chapter), or any right thereunder, shall be transferred, assigned, or in any manner disposed of, either voluntarily or involuntarily, directly or indirectly, through transfer or control of the license to any person, unless the Commission gives its consent in writing.

According to the application, CVPS' interest in the Yankee Companies is as a shareholder only. Each Yankee Company holds a Part 50 license and a general Part 72 license for an Independent Spent Fuel Storage Installation (ISFSI) and is the sole licensee for its facility. CVPS has no operational authority for the Yankee Companies' licensed ISFSIs. In addition, CVPS is not a party to any voting agreement or arrangement with any of the owners or licensees of the Yankee Companies that could give it voting rights that are greater than those associated with its minority shareholder interests in the companies. It does not have other financial interests that would allow it to participate in the management and operation of the licensee. Accordingly, the result of the proposed merger between CVPS and Gaz Métro, and the associated interests in the Yankee Companies, does not result in a transfer of control with respect to the Yankee Companies and the Yankee Company licenses.

Regarding foreign ownership, control, or domination, Section 103d of the Atomic Energy Act of 1954, as amended provides in part:

> No license may be issued to an alien or any corporation or other entity if the Commission know or has reason to believe it is owned, controlled, or dominated by an alien, a foreign corporation or a foreign government. In any event, no license may be issued to any person within the United States if, in the opinion of the Commission, the issuance of a license to such a person would be inimical to the common defense and security or to the health and safety of the public.

The NRC's regulation 10 CFR 50.38 contains language to implement this statutory prohibition.

As stated, the result of the proposed merger between CVPS and Gaz Métro, and the associated interests in the Yankee Companies, does not result in a transfer of control with respect to the Yankee Companies and the Yankee Company licenses, and does not provide CVPS or Gaz Metro with any responsibility over spent fuel, access to restricted data, or right of participation, whether or not exercised, in the management and operation of the licensees. Additionally, as a result of the afore-mentioned indirect license transfer for Millstone 3 (ML121300466), CVPS is implementing a Negation Action Plan (NAP) to ensure that any foreign ownership, control, or domination of Millstone 3 and the Yankee Companies is negated. NRC staff reviewed and

approved this NAP as part of the safety evaluation for the indirect license transfer. Furthermore, in an unrelated licensing action, a NAP has been implemented for each of the Yankee Companies via confirmatory orders issued by the NRC (ML12124A372, ML12124A373, ML12124A374), which negate foreign ownership, control, or domination of the Yankee Companies.

## 4.0 CONCLUSION

The NRC staff conducted a threshold review of the facts and information as set forth in the application, and has considered how the proposed merger between CVPS and Gaz Métro will be implemented as described in the application. The NRC staff concludes that the proposed merger will not result in a transfer of control with respect to the Yankee Companies, and, thus, CVPS and Gaz Métro do not require the NRC's approval under Section 184 of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.80 with respect to the afore-mentioned licenses. In addition, based on the application, the NRC concludes that the foreign ownership, control, or domination of the Yankee Company licensees has been negated by existing Negation Action Plans.

Principal Contributor: Shawn Harwell

Date: June 15, 2012

The Order has been forwarded to the Office of the Federal Register for publication.

Sincerely,

/RA/

James Kim, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-423

Enclosures:
1. Order
2. Safety Evaluation
3. No Threshold Evaluation

cc w/encls: Daniel F. Stenger
Hogan Lovells US LLP
555 Thirteenth Street, NW
Washington, DC 20004

Thomas L. Cubbage, III
Covington & Burling LLP
1201 Pennsylvania Avenue, NW
Washington, DC 20004

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**ADAMS Accession Nos: Package ML121300466** **Transmittal Letter: ML121300472**
**Order (Enclosure 1): ML121300481** **SE (Enclosure 2): ML121300496**
**No Threshold Evaluation (Enclosure 3): ML12165A508**

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| DATE | 6/15/12 | 6/15/12 | | | |

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**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
**REGION I**
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

June 20, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Resources
5000 Dominion Blvd.
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION UNITS 2 AND 3 - NRC COMPONENT DESIGN BASES INSPECTION REPORT 05000336/2012007 AND 05000423/2012007

Dear Mr. Heacock:

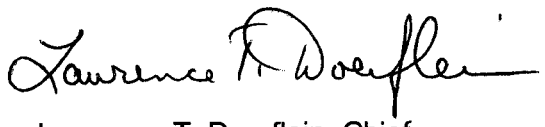
On May 11, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Millstone Power Station, Units 2 and 3. The enclosed inspection report documents the inspection results, which were discussed on May 11, 2012, with Mr. Stephen E. Scace, Site Vice President, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. In conducting the inspection, the team examined the adequacy of selected components to mitigate postulated transients, initiating events, and design basis accidents. The inspection involved field walkdowns, examination of selected procedures, calculations and records, and interviews with station personnel.

This report documents one NRC-identified finding of very low safety significance (Green). This finding was determined to be a violation of NRC requirements. However, because of the very low safety significance and because it was entered into your corrective action program, the NRC is treating this finding as a non-cited violation (NCV) consistent with Section 2.3.2.a of the NRC's Enforcement Policy. If you contest the NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Senior Resident Inspector at Millstone Power Station. In addition, if you disagree with the cross-cutting aspect assigned to the finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Senior Resident Inspector at Millstone Power Station.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Docket Room or from the Publicly Available Records component of NRC's document system, Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,



Lawrence T. Doerflein, Chief
Engineering Branch 2
Division of Reactor Safety

Docket No. 50-336, 50-423
License No. DPR-65, NPF-49

Enclosure:
Inspection Report 05000336/2012007 and 05000423/2012007
w/Attachment: Supplemental Information

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In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Docket Room or from the Publicly Available Records component of NRC's document system, Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

*/RA/*

Lawrence T. Doerflein, Chief
Engineering Branch 2
Division of Reactor Safety

Docket No. 50-336, 50-423
License No. DPR-65, NPF-49

Enclosure:
Inspection Report 05000336/2012007 and 05000423/2012007
w/Attachment: Supplemental Information

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ADAMS ACCESSION NUMBER: ML12172A119

| ☑ SUNSI Review | | ☑ Non-Sensitive ☐ Sensitive | | ☑ Publicly Available ☐ Non-Publicly Available | |
|---|---|---|---|---|---|
| OFFICE | RI/DRS | RI/DRS | RI/DRP | RI/DRS | |
| NAME | EBurket* | CCahill* | RBellamy* | LDoerflein | |
| DATE | 5/29/12 | 5/31/12 | 6/1/12 | 6/20/12 | |

* See Previous Concurrence

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

| | |
|---|---|
| Docket No: | 50-336, 50-423 |
| License No: | DPR-65, NPF-49 |
| Report No: | 05000336/2012007 and 05000423/2012007 |
| Licensee: | Dominion Nuclear Connecticut, Inc. |
| Facility: | Millstone Power Station, Units 2 and 3 |
| Location: | P.O. Box 128<br>Waterford, CT 06385 |
| Inspection Period: | April 16 through May 11, 2012 |
| Inspectors: | E. Burket, Reactor Inspector, Division of Reactor Safety (DRS), Team Leader<br>S. Pindale, Senior Reactor Inspector, DRS<br>J. Richmond, Senior Reactor Inspector, DRS<br>D. Orr, Senior Reactor Inspector, DRS<br>S. Rich, Vermont Yankee Resident Inspector, Division of Reactor Projects<br>C. Edwards, NRC Mechanical Contractor<br>S. Kobylarz, NRC Electrical Contractor |
| Approved By: | Lawrence T. Doerflein, Chief<br>Engineering Branch 2<br>Division of Reactor Safety |

## SUMMARY OF FINDINGS

IR 05000336/2012007, 05000423/2012007; 4/16/2012 – 5/11/2012; Millstone Power Station, Units 2 and 3; Component Design Bases Inspection.

The report covers the Component Design Bases Inspection conducted by a team of five U.S. Nuclear Regulatory Commission (NRC) inspectors and two NRC contractors. One finding of very low safety significance (Green) was identified. The finding was considered to be a non-cited violation (NCV). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process." Cross-cutting aspects associated with findings are determined using IMC 0310, "Components Within the Cross-Cutting Areas." The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

NRC-Identified Findings

**Cornerstone: Mitigating Systems**

- Green: The team identified a finding of very low safety significance (Green) involving a non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion III, Design Control, because Dominion had not verified the adequacy of their design with respect to the Unit 2 emergency motor control center (MCC) control circuit voltage drop calculation. Specifically, Dominion did not account for various parameters that affect available voltage at motor starter contactors including fuse resistance, minimum control power transformer (CPT) size, maximum control circuit cable length, actual quantity of control circuit contacts, and containment temperature during a design basis accident (DBA). As a result, the worst case circuit conditions for determining acceptable contactor voltage were not evaluated. Dominion entered the issue into the corrective action program and performed an operability assessment of the most bounding circuit and determined that sufficient voltage would be available to meet its design basis function.

  The performance deficiency was determined to be more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. The team evaluated the finding in accordance with IMC 0609, Significance Determination Process, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings." The finding was determined to be of very low safety significance because the design deficiency was confirmed not to result in loss of operability or functionality. The team determined that this finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program because Dominion did not thoroughly evaluate the problem when it was identified and entered into the corrective action program in 2009. [IMC 0310, Aspect P.1(c)] (Section 1R21.2.1.1)

REPORT DETAILS

## 1. REACTOR SAFETY

### Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R21 Component Design Bases Inspection (IP 71111.21)

.1 Inspection Sample Selection Process

The team selected risk significant components for review using information contained in the Millstone Probabilistic Risk Assessment (PRA) and the U.S. Nuclear Regulatory Commission's (NRC) Standardized Plant Analysis Risk (SPAR) model for the Millstone Power Station. Additionally, the team referenced the Risk-Informed Inspection Notebook for the Millstone Power Station (Revision 2.1a) in the selection of potential components for review. In general, the selection process focused on components that had a Risk Achievement Worth (RAW) factor greater than 1.3 or a Risk Reduction Worth (RRW) factor greater than 1.005. The components selected were associated with both safety-related and non-safety related systems, and included a variety of components such as pumps, transformers, diesel engines, batteries, and valves.

The team initially compiled a list of components based on the risk factors previously mentioned. Additionally, the team reviewed the previous component design bases inspection (CDBI) reports (05000336/2009006 & 05000423/2009006 and 05000336/2006010 & 05000423/2006010) and excluded the majority of those components previously inspected. The team then performed a margin assessment to narrow the focus of the inspection to 24 components and four operating experience (OE) items. The team selected a main steam isolation valve (MSIV) to review for large early release frequency (LERF) implications. The team's evaluation of possible low design margin included consideration of original design issues, margin reductions due to modifications, or margin reductions identified as a result of material condition/equipment reliability issues. The assessment also included items such as failed performance test results, corrective action history, repeated maintenance, Maintenance Rule (a)(1) status, operability reviews for degraded conditions, NRC resident inspector insights, system health reports, and industry OE. Finally, consideration was also given to the uniqueness and complexity of the design and the available defense-in-depth margins.

The inspection performed by the team was conducted as outlined in NRC Inspection Procedure (IP) 71111.21. This inspection effort included walkdowns of selected components; interviews with operators, system engineers, and design engineers; and reviews of associated design documents and calculations to assess the adequacy of the components to meet design basis, licensing basis, and risk-informed beyond design basis requirements. Summaries of the reviews performed for each component and OE sample are discussed in the subsequent sections of this report. Documents reviewed for this inspection are listed in the Attachment.

.2 Results of Detailed Reviews

.2.1 Results of Detailed Component Reviews (24 samples)

.2.1.1 Unit 2 Shutdown Cooling System Suction Valve, 2-SI-652

a. Inspection Scope

The team inspected the shutdown cooling system motor operated valve to verify that it was capable of meeting its design basis requirements at degraded voltage conditions at the motor starter and the motor terminals. The team confirmed the calculated minimum voltage at the motor terminals and motor starter contactor was based on the motor control center voltage available at degraded grid conditions. Finally, corrective action condition reports (CR) and system health reports were reviewed to verify deficiencies were appropriately identified and resolved, and that the motor and starter were properly maintained.

b. Findings

Introduction: The team identified a finding of very low safety significance (Green) involving a non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion III, Design Control, because Dominion had not verified the adequacy of their design with respect to the Unit 2 emergency motor control center (MCC) control circuit voltage drop calculation. Specifically, Dominion did not account for various parameters that affect available voltage at safety-related motor starter contactors including fuse resistance, minimum control power transformer (CPT) size, maximum control circuit cable length, actual quantity of control circuit contacts, and containment temperature during a design basis accident (DBA). Therefore, the worst case circuit conditions had not been evaluated.

Description: The team found during review of calculation PA-91-004-290E2, Emergency MCC Control Circuit Voltage Drop, that Dominion did not properly validate assumptions for bounding the effects on circuit resistance with respect to the maximum control circuit cable conductor temperature for DBA conditions, the effects of control power transformer secondary-side fuse resistance, and the effect on circuit resistance for the actual quantity of control circuit contacts. The team noted that the calculation also did not consider circuits with the smallest control power transformer (CPT), with the smallest CPT fuse, and with the maximum control circuit length when determining the voltage available at MCC contactor coils. As a result, the team concluded the worst case circuit conditions for determining acceptable contactor voltage were not evaluated.

The team noted that 90 volts was considered to be the minimum acceptable voltage for contactor pickup based on data from the manufacturer and plant testing that was performed on spare contactors in 1993. The team confirmed that adequate voltage would be available for the 2-SI-652 contactor when considering the circuit conditions that were not previously evaluated, such as fuse resistance and control circuit cable conductor temperature during DBA conditions inside containment. However, the team noted that worst case conditions were not evaluated for other contactor control circuits, specifically circuits that contained a 60 volt-ampere CPT, a 0.6 ampere CPT secondary

fuse, the longest control circuit length, and the maximum number of control circuit contacts, all of which contribute to an increase in the voltage drop to the contactor when it is energized during pick-up. The team was concerned that the worst case or bounding circuit conditions were not evaluated by Dominion and that the available contactor voltage for limiting conditions was not determined. Dominion addressed the team's concerns by determining that the service water pump strainer motor circuit B5154 was the worst case for pick-up voltage drop to the contactor based on a preliminary calculation. Dominion engineers calculated that the voltage available at the contactor coil was 90.19 volts, which was slightly more than 90 volts that was evaluated to be the minimum acceptable pick-up voltage. The team reviewed the design inputs for the preliminary calculation to verify conservatism in the parameters that were evaluated to provide assurance that the worst case or bounding conditions were considered. The team confirmed for circuit B5154 that the available contactor voltage in the preliminary calculation was marginally acceptable and the calculation supported Dominion's operability assessment in condition report (CR) 474634.

During the 2009 component design basis inspection (CDBI), a question was raised by the team regarding the assumptions used in calculation PA-91-004-290E2. To address the question, Dominion initiated a condition report (CR322576) with a corrective action to review the calculation and provide clarification and a more accurate justification for the assumptions used. At the time, Dominion did not have any concerns with operability of the circuits because they felt the assumptions were conservative and that the worst case circuit was bounded. Upon the start of the 2012 CDBI, the condition report was still open with a pending due date of November, 2012.

Analysis: The team determined that the failure to adequately validate calculation assumptions and determine the adequacy of the voltage at safety-related motor operated valve contactors for the most limiting control circuit components and design basis accident environmental conditions was a performance deficiency. The performance deficiency was more than minor because it was similar to IMC 0612, Appendix E, Examples of Minor Issues, Example 3.j, in that the design analysis deficiency resulted in a condition where the team had reasonable doubt regarding the operability of various motor control circuits. In addition, the performance deficiency was associated with the design control attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. In accordance with IMC 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," the team conducted a Phase 1 Significance Determination Process (SDP) screening and determined the finding was of very low safety significance (Green) because it was a design deficiency confirmed not to result in a loss of operability in functionality.

This finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because Dominion did not thoroughly evaluate this problem when it was identified in 2009. Dominion's evaluation in 2009 incorrectly determined that assumptions were valid and that the worst case circuit was bounded. [IMC 0310, Aspect P.1(c)]

Enforcement: 10 CFR Part 50, Appendix B, Criterion III, Design Control, requires, in part, that design control measures provide for verifying or checking the adequacy of design. Contrary to the above, as of May 10, 2012, Dominion's design control measures had not verified the adequacy of the design regarding the Unit 2 emergency MCC control circuit voltage drop calculation. Specifically, not all parameters which affect voltage were accounted for in the calculation and the calculation did not determine the effect on available voltage at contactors for the most limiting circuit components and design basis environmental conditions. Because this violation is of very low safety significance, and has been entered into Dominion's corrective action program (CR 474634), this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000336/2012007-01, Inadequate Assumptions used in Emergency Motor Control Center Control Circuit Voltage Drop Calculation)**

.2.1.2 Unit 2 'B' Reactor Building Closed Cooling Water Heat Exchanger, X18B

a. Inspection Scope

The team inspected the 'B' reactor building component cooling water (RBCCW) heat exchanger to ensure that it was capable of removing the required heat loads during design basis events. The team reviewed design basis documents, eddy current and thermal performance test results, service water full flow test results, and heat exchanger cleaning and inspection reports to verify that the heat exchanger could maintain adequate heat removal capability and system integrity during design basis events. The team reviewed selected operating procedures for normal, abnormal, and emergency conditions to ensure consistency with the licensing and design bases. Additionally, the team performed a walkdown of the heat exchanger, interviewed system and design engineers, and reviewed system health reports to evaluate the material condition of the heat exchanger as well as overall component health. Finally, the team reviewed corrective action documents to verify Dominion was identifying and correcting issues, and to verify there were no adverse trends.

b. Findings

No findings were identified.

.2.1.3 Unit 2 'A' Service Water Strainer, L1A

a. Inspection Scope

The team selected the 'A' service water (SW) strainer for review to verify it was capable of performing its design basis function. This component is located immediately downstream of the service water pump and provides filtration of particulate from the service water flow streams prior to their distribution to various safety-related and non-safety-related heat exchangers. The team reviewed selected operating procedures for normal, abnormal, and emergency conditions to ensure consistency with the licensing and design bases. The team reviewed maintenance procedures and completed work orders to verify those activities were performed in accordance with vendor recommendations. The team performed a walkdown of all three strainers to assess their

material condition and their operating environment. The team discussed design, operation, and component history with engineering staff to evaluate performance history and overall component health. Finally, the team reviewed recent corrective action documents and system health reports to determine if there were any adverse trends associated with the strainer, and to verify Dominion was identifying and correcting issues.

b. Findings

No findings were identified.

.2.1.4 Unit 2 'A' Main Steam Atmospheric Dump Valve, 2-MS-190A

a. Inspection Scope

The team inspected the 'A' main steam atmospheric dump valve (ADV) to verify the valve was capable of performing its design basis function. The ADV is an air operated valve that provides steam generator pressure control and decay heat removal when the main condenser is unavailable. The valve is a normally closed valve that fails closed when control power or instrument air are lost but can be opened manually to perform its function.

The team reviewed the updated final safety analysis report (UFSAR), the technical specifications (TS), and the TS Bases to identify the design basis requirements of the valve. The team reviewed drawings, operating and maintenance procedures, and completed maintenance and modifications to verify the safety function was maintained. The team reviewed valve testing procedures and stroke timing data to verify acceptance criteria were adequate and that performance was not degrading. The team discussed design, operation, and component history with engineering and operations staff to evaluate performance history, overall component health, and the feasibility of manual operation during emergencies. The team also conducted a walkdown of the 'A' ADV to assess its material condition and to verify the installed configuration was consistent with plant drawings, procedures, and the design basis. Finally, the team reviewed corrective action documents to verify Dominion was identifying and correcting issues, and to verify there were no adverse trends.

b. Findings

No findings were identified.

.2.1.5 Unit 2 'A' Main Steam Isolation Valve, 2-MS-64A

a. Inspection Scope

The team inspected the 'A' main steam isolation valve (MSIV) to verify the valve was capable of performing its design basis function. The MSIV is an air operated valve that closes to isolate the 'A' steam generator on low pressure in either 'A' or 'B' steam generator or high containment pressure. The valve is normally open and fails closed on a loss of control power or instrument air.

The team reviewed the UFSAR, the TS, and the TS Bases to identify the design basis requirements of the valve. The team reviewed drawings, operating procedures and completed maintenance to verify the safety function was maintained. The team reviewed valve testing procedures and stroke timing data to verify acceptance criteria were adequate and that performance was not degrading. The team discussed design, operation and component history with engineering staff to evaluate performance history and overall component health. The team also conducted a walkdown of both MSIVs to assess their material condition, and to verify installed configuration was consistent with plant drawings, procedures, and the design basis. Finally, the team reviewed corrective action documents to verify Dominion was identifying and correcting issues, and to verify there were no adverse trends.

b. Findings

No findings were identified.

.2.1.6 Unit 2 'B' Emergency Diesel Generator Electrical Review, H7B

a. Inspection Scope

The team inspected the 'B' emergency diesel generator (EDG) to verify that it was capable of meeting its design basis function. The team reviewed the one-line diagrams for the EDG, the vendor nameplate rating data, and the EDG load study to ensure that the EDG was operated consistent with its rating, and capable of operating under the worst case design basis loading conditions. The team's review included the starting components, such as starting air solenoids, generator field flash, and the generator breaker close coil. The team reviewed the adequacy of voltage available for the starting components, and ensured that surveillance testing adequately verified that the components would be functional. The team reviewed the brake horsepower basis for selected pump motors to ensure loads were adequately considered in the loading study at worst case motor load conditions. The team also performed walkdowns of the Unit 2 EDGs to assess the material condition and the operating environment for indications of degradation of equipment. Finally, corrective action documents and system health reports were reviewed to verify deficiencies were appropriately identified and resolved, and that the emergency diesel generator was properly maintained.

b. Findings

No findings were identified.

.2.1.7 Unit 2 'A' 125 Vdc Battery and DC Bus 201A

a. Inspection Scope

The team reviewed the design, testing, and operation of the 'A' 125 Vdc battery and the 201A DC bus to verify they could perform their design basis functions to provide direct current (DC) power to connected loads during normal, transient, and postulated accident conditions, including station blackout (SBO) events. Specifically, the team reviewed

design calculations and drawings, including the battery sizing calculation, load profile studies, short circuit analysis, voltage drop calculations, and battery terminal connection resistances. The team performed this review to evaluate whether the battery capacity and DC distribution system were adequate for the equipment load and duration required by design and licensing requirements, and to assess whether adequate voltage was available to meet minimum voltage specifications for connected loads during worst case loading conditions. In addition, the team also reviewed the DC over current protective coordination studies to verify there was adequate protection for postulated faults in the DC system.

The team reviewed battery maintenance and surveillance tests, including performance and service discharge tests and routine surveillance tests, to assess whether the testing and maintenance was sufficient and whether those activities were performed in accordance with approved procedures, vendor recommendations, industry standards, and design and licensing requirements. The team compared the service test and performance test load profiles to the load profile studies for the loss-of-coolant accident (LOCA) with a concurrent loss-of-offsite power and the SBO design assumptions to verify the load testing enveloped the predicted worst case loading conditions. In addition, the team compared as-found test and inspection results to established acceptance criteria to evaluate the as-found conditions and assess whether those conditions conformed to design basis assumptions and regulatory requirements.

In addition, the team interviewed design and system engineers, maintenance technicians, and licensed operators regarding the design, operation, testing, and maintenance of the battery and battery bus. The team performed field walkdowns of the battery and battery bus to independently assess the material condition of the battery cells and associated electrical equipment, and to determine whether the system alignment and operating environment was consistent with design basis assumptions. Specifically, the team visually inspected the battery for signs of degradation, such as excessive terminal corrosion and electrolyte leaks. Finally, the team reviewed recent corrective action documents and system health reports to determine whether there were any adverse operating trends, and to assess Dominion's capability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.8 Unit 2 Condensate Storage Tank, T40

a. Inspection Scope

The team reviewed the design, testing, inspection, and operation of the condensate storage tank (CST), and associated tank level instruments, to evaluate whether it could perform its design basis function as the preferred water source for the auxiliary feedwater pumps. Specifically, the team reviewed design calculations, drawings, and vendor specifications, including tank sizing and level uncertainty analysis, and pump vortex calculations to evaluate the adequacy and appropriateness of design assumptions and operating limits.

The team interviewed system and design engineers, and reviewed instrument test records and tank inspection procedures to determine whether maintenance and testing was adequate to ensure reliable operation and to evaluate whether those activities were performed in accordance with regulatory requirements, industry standards, and vendor recommendations. The team also reviewed results of recent internal and external visual inspections of the CST, and conducted a walkdown of the tank area to independently assess the material condition of the CST and associated instrumentation. Finally, the team reviewed recent corrective action documents and system health reports to determine if there were any adverse trends associated with the CST, and to assess Dominion's capability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.9 Unit 2 'A' Power Operated Relief Valve, RC402

a. Inspection Scope

The team reviewed the design, testing, and operation of the 'A' power operated relief valve (PORV) to assess whether it could perform its design functions. Specifically, the team reviewed design calculations and specifications, the reactor coolant system design basis summary document, the TS and TS Bases, drawings, the vendor manual, and operating procedures to evaluate the PORV's adequacy for plant pressure control at normal operating temperature and pressure, reactor vessel low-temperature over-pressure protection, and to provide a flow path for primary side feed and bleed operations using the emergency operating procedures.

The team reviewed surveillance test records and operating procedures to assess whether the PORV was appropriately tested and operated within required design limits and whether testing adequately verified component functionality. The team compared recent as-found test and inspection results to established acceptance criteria to evaluate the as-found conditions and assess whether those conditions conformed to design basis assumptions and regulatory requirements. The team's review included PORV steam and water relief capacity at expected plant operating conditions, PORV seat leakage history, and assessment of any adverse impact due to seat leakage. In addition to the mechanical review, the team also assessed whether the PORV solenoid would have adequate minimum DC voltage to operate under worst case 125 Vdc battery loading conditions. Finally, the team reviewed recent corrective action documents and system health reports to determine whether there were any adverse trends, and to assess Dominion's capability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.10 Unit 2 'A' Motor Driven Auxiliary Feedwater Pump, AFW-P9A

a. Inspection Scope

The team inspected the 'A' motor driven auxiliary feedwater (AFW) pump to verify that it was capable of meeting its design basis requirements. The AFW pumps provide emergency feedwater to the steam generators in response to transient and accident events for all credible feedwater line break, main steam line break, and steam generator tube rupture scenarios. The team reviewed the AFW system hydraulic model and the design basis hydraulic analysis/calculations to verify that required total dynamic head (TDH), required net positive suction head (NPSH), and potential for vortex formation had been properly considered under all DBA/event conditions. The team reviewed system operating procedures to ensure they were consistent with the design function of the pump and with relevant calculations for maintaining adequate NPSH, control of vortexing, and prevention of pump runout.

The team also reviewed pump in-service test (IST) procedures, recent test results, and trends in test data to verify that pump performance was consistent with design basis requirements. The IST acceptance criteria were reviewed to verify appropriate correlation to accident analyses conditions, taking into account set-point tolerances and instrument inaccuracies. Additionally, the team discussed the AFW pump design, operation, and performance with the engineering staff, and reviewed operator logs to evaluate pump performance. Seismic design documentation was reviewed to verify pump design was consistent with limiting seismic conditions. The team reviewed design documentation to verify pump motor design was consistent with the environmental qualification (EQ) basis for limiting temperature/radiation conditions. The team conducted a detailed walkdown of the pump to assess the material and environmental conditions, and to verify that the installed configuration was consistent with system drawings, and the design and licensing bases. The team reviewed the maintenance history of the pump and system by sampling corrective action documents, work orders, and system health reports to ensure there were no adverse trends and to assess Dominion's ability to identify, evaluate, and correct problems.

b. Findings

No findings were identified.

.2.1.11 Unit 2 'B' Containment Air Recirculation Unit, F14B

a. Inspection Scope

The 'B' containment air recirculation (CAR) unit is one of four ventilation fans with associated coolers and has a risk important function to remove containment heat during design basis accidents, such as a loss-of-coolant accident or a main steam line break in containment. The team inspected the CAR unit to verify it was capable of meeting its design basis requirements during these postulated accidents. The team reviewed electrical diagrams associated with breaker and fan controls, and piping and instrument

diagrams associated with containment ventilation and the RBCCW system to ensure all components of the 'B' CAR unit were appropriately included in a test or maintenance program. The team verified that Dominion ensured through testing and flow balance measurements of the RBCCW system that the flow as assumed in containment temperature and pressure response calculations was obtained for each CAR unit. The team verified that CAR unit surveillance testing was performed consistent with technical specification requirements and replicated the system response that would exist during a safety injection actuation signal. The team verified breaker overcurrent protective relay set-points to ensure that the 'B' CAR fan motor and electrical bus were adequately protected but that the CAR unit was not subject to spurious tripping, and to determine whether proper coordination was maintained. The team also reviewed corrective action documents and system health reports, and interviewed system and design engineers to determine whether there were any adverse operating trends or existing issues affecting 'B' CAR unit reliability. Finally, the team performed a visual examination of control room CAR unit controls and 480Vac breakers at associated load centers.

b. Findings

No findings were identified.

.2.1.12 Unit 2 4160 Volt Bus 24E/34B Tie Breaker, A505

a. Inspection Scope

The team inspected the 4.16kV Bus 24E/34B tie breaker A505 to verify it was capable of meeting its design basis requirements. The team reviewed bus load flow calculations to determine whether the breaker was applied within its specified capacity rating under worst case accident loading and grid voltage conditions. The team reviewed short circuit calculations to determine whether the circuit breaker was applied within its specified ratings. The team reviewed schematic diagrams and calculations for 4.16kV bus protective relays to ensure that equipment was adequately protected, the breaker was not subject to spurious tripping, and to determine whether proper coordination was maintained. The team performed a visual inspection of the A505 breaker and its protective relays to assess material condition and the presence of hazards that could impact the operation of the equipment. The team reviewed preventive maintenance procedures and verified that maintenance was performed on the breaker consistent with vendor requirements. The team reviewed 4.16kV breaker operating procedures to ensure racking-in operations appropriately performed testing to verify breaker operability upon return to service. The team specifically reviewed breaker trip and close coil pickup voltage testing to ensure the 125Vdc system would support 4.16kV breaker operation during station blackout events. Finally, the team reviewed corrective action documents and completed maintenance and testing records to determine whether there were any adverse operating trends, and to verify deficiencies were appropriately identified and resolved.

b. Findings

No findings were identified.

.2.1.13 Unit 3 'A' Boric Acid Transfer Pump, 3CHS*P2A

a. Inspection Scope

The team inspected the 'A' boric acid transfer pump (BATP) to verify the pump was capable of performing its design basis function. The BATP is a canned centrifugal pump that provides a flow of concentrated boric acid to the suction of the charging pumps to control reactivity during normal and abnormal conditions. The pump automatically starts on a safety injection actuation signal, and it is capable of being manually controlled to provide enough boric acid to bring the reactor to hot shutdown conditions without any control rod assemblies inserted.

The team reviewed the UFSAR, the Technical Requirements Manual (TRM) and TRM basis, and the design basis summary document to identify the design basis requirements for the pump. The team reviewed drawings, operating procedures, and completed maintenance documents to verify the pump function was maintained. The team reviewed pump IST procedures and results to verify acceptance criteria were adequate and that performance was not degrading. The team reviewed the BATP net positive suction head requirement and available NPSH to ensure the pump was capable of fulfilling its safety function at the required flowrate with low tank level. The team discussed design, operation, maintenance and component history with engineering staff to evaluate performance history and overall component health. The team also conducted a walkdown of both BATPs to assess material condition and to verify installed configuration was consistent with plant drawings and procedures, and the design basis. Finally, the team reviewed corrective action documents to verify Dominion was identifying and correcting issues, and to verify there were no adverse trends.

b. Findings

No findings were identified.

.2.1.14 Unit 3 Reactor Plant Component Cooling Water Surge Tank, 3CCP*TK1

a. Inspection Scope

The team inspected the reactor plant component cooling water (RPCCW) surge tank and associated level switches to verify the tank was capable of performing its design basis function. The surge tank provides net positive suction head for the RPCCW pumps and makeup water for the RPCCW system. The tank is divided by a partition that extends partway up the tank so that the loss of water from one train of the RPCCW system will not affect the other train. The RPCCW system consists of safety and non-safety related piping, and the level switches isolate the non-safety-related piping on decreasing surge tank level, preventing a failure of the non-safety portion from impacting the safety-related function of the system.

The team reviewed the UFSAR, the TS and TS Bases, and the design basis summary document to identify the design basis requirements for the tank and level switches. The team reviewed tank volume calculations and the level switch set-point calculation to verify sufficient volume would be maintained in the tank under all conditions. The team reviewed drawings, operating procedures, and completed maintenance documents to verify the tank and level switch functions were maintained. The team reviewed tank internal and external inspection results to verify tank condition was not degrading. The team discussed design, operation, maintenance, and component history with engineering staff to evaluate performance history and overall component health. The team also conducted a walkdown of the tank, the level switches, and portions of the RPCCW piping to verify the installed configuration was consistent with plant drawings, procedures, and the design basis. Finally, the team reviewed corrective action documents to verify Dominion was identifying and correcting issues, and to verify there were no adverse trends.

b. Findings

No findings were identified.

.2.1.15 Unit 3 'A' Emergency Diesel Generator (3EGS*EG-A) Mechanical Support Systems

a. Inspection Scope

The team inspected the mechanical support systems associated with the 'A' emergency diesel generator, including the fuel oil, starting air, ventilation, and jacket water cooling systems to ensure the EDG could perform its design basis function in response to transient and design basis events. The team reviewed the UFSAR, TS, design basis calculations, vendor documents, and procedures to identify the design basis, maintenance, and operational requirements for the EDG and its support systems. The team reviewed fuel oil consumption calculations to ensure TS requirements were met under design basis loading conditions. The team also reviewed the design specification for the starting air system, air start test results, and the normal operating pressure band to verify that the starting air system was properly sized and could meet its design function for successive starts. The team reviewed EDG surveillance test results, operating procedures and maintenance work packages to determine the overall health of the EDG engine and its mechanical support systems.

The team performed several field walkdowns of both Unit 3 EDGs to independently assess the material condition and the operating environment of the EDGs and associated equipment. During the walkdowns, the team compared local and remote EDG control switch positions, breaker position indicating lights, and system alignments to design and licensing basis assumptions to verify the adequacy of Dominion's configuration control. The team interviewed engineers to evaluate past performance and operation of the EDGs. The team reviewed the system health report and corrective action documents to determine if there was any adverse equipment operating trends, and to ensure problems were properly identified and corrected. Additionally, the team observed portions of the 3A EDG monthly test on April 17, 2012, and conducted pre- and post-operation walkdowns to ensure proper operation and to assess material condition.

b. Findings

No findings were identified.

.2.1.16 Unit 3 Safety Injection Pump Discharge to Hot Leg Containment Penetration Isolation Valve, 3SIH*CV8824

a. Inspection Scope

The team inspected the safety injection pump discharge to hot leg containment penetration isolation valve to verify that it was capable of meeting its design basis function of closing automatically upon receipt of a Phase A containment isolation signal. The team reviewed diagnostic testing and in-service test results, including stroke time and friction and seat loading, to verify acceptance criteria were met and performance degradation could be identified. The team reviewed design documentation to verify the valve and its actuator were operated consistent with design requirements. The team reviewed the functional history of the isolation valve by sampling corrective action reports, the system health report, and preventive and corrective maintenance records to ensure Dominion appropriately identified, characterized, and corrected problems.

b. Findings

No findings were identified.

.2.1.17 Unit 3 480 Volt Bus 32R Transformer, 34C5-1X

a. Inspection Scope

The team inspected the 4160-480 volt transformer 34C5-1X to verify that it was capable of meeting its design basis requirements. The transformer was designed to provide power to 480 volt emergency bus 32R. The team reviewed load calculations to determine the design basis maximum load and reviewed the bus load center equipment vendor ratings to ensure they were in conformance with the design basis. The team also reviewed the coordination/protection calculation for the transformer incoming line and load side breakers for design basis load flow conditions, and transformer protection and coordination. The team performed a walkdown of the transformer to assess the observable material condition. Also, the team reviewed surveillance tests to verify the acceptance criteria satisfied design basis load requirements and transformer protection settings. Finally, the team reviewed corrective action reports and system health reports to verify deficiencies were appropriately identified and resolved.

b. Findings

No findings were identified.

.2.1.18 Unit 3 4160 Volt Bus 34D

a. Inspection Scope

The team inspected bus 34D to verify that it was capable of meeting its design basis requirements. The bus switchgear is designed to provide power to and to control the operation of the connected safety-related loads. The team reviewed load calculations to determine the design basis for maximum load and reviewed the switchgear equipment vendor ratings for conformance with the design basis. The team also reviewed the coordination/protection calculation for the incoming line and feeder breakers for design basis load flow conditions, and bus protection and coordination. The team performed a walkdown of bus 34D to assess the observable material condition. The team also reviewed surveillance tests on the incoming line and feeder breakers for adequacy of results in accordance with design basis setting requirements. Finally, corrective action documents and system health reports were reviewed to verify deficiencies were appropriately identified and resolved, and that the bus 34D switchgear was properly maintained.

b. Findings

No findings were identified.

.2.1.19 Unit 3 'D' Service Water Pump, 3-SWP-P1D

a. Inspection Scope

The team inspected the 'D' service water pump to verify that the pump was capable of performing its design basis function. The pump has a safety-related function to provide an adequate supply of cooling water flow to safety-related components during abnormal and accident conditions such as a LOCA or a loss-of-offsite power. In addition, the pump provides an emergency source of make-up water to the spent fuel pool and an emergency backup source of water to the auxiliary feedwater system and to the control building chilled water system.

The team reviewed the SW pump submergence requirements and available submergence to ensure the pump was capable of fulfilling its safety function at the maximum flowrate assumed and lowest intake level. The team assessed the system hydraulic calculations under normal, transient, and LOCA conditions to ensure the pump provided adequate cooling to safety-related components and that design requirements for flow and pressure were properly translated into IST acceptance criteria. The team evaluated pump performance to ensure there was no degradation by reviewing IST results. Additionally, the team discussed the SW pump design, operation, and performance with the engineering staff, and reviewed operator logs to evaluate pump performance. Seismic design documentation was reviewed to verify pump design was consistent with limiting seismic conditions. The team reviewed design documentation to verify pump motor design was consistent with limiting environmental conditions. The

team reviewed the SW pump performance curve and design basis flow requirement to evaluate the required capacity for the brake horsepower required by the pump during design basis conditions.

In addition to the mechanical review, the team reviewed the 4160 Vac system load flow calculation and motor nameplate data to confirm that adequate voltage would be available at the motor terminals for design basis conditions. The inspectors also reviewed the motor overcurrent relay setting calculation, relay settings and recent overcurrent relay calibration tests to evaluate whether the protective relays would provide for reliable motor operation at design basis minimum voltage conditions. The team conducted a detailed walkdown of the pump and SW bay to assess the material and environmental conditions, and to verify that the installed configuration was consistent with system drawings, and the design and licensing bases. Finally, corrective action documents and system health reports were reviewed to verify deficiencies were appropriately identified and resolved, and that the 'D' SW pump and motor were properly maintained.

b. Findings

No findings were identified.

.2.1.20 Unit 3 'B' 125 Vdc Battery Bus, 301B-1

a. Inspection Scope

The team reviewed the design, testing, and operation of the 125 Vdc battery bus, and associated distribution panels to evaluate whether the loading of the DC bus was within equipment ratings and to determine whether the bus could perform its design basis function to reliably power the associated loads under worst case conditions. Specifically, the team reviewed calculations and drawings, including voltage drop calculations, short circuit analysis, and load profile studies to evaluate the adequacy and appropriateness of design assumptions. The team also reviewed the DC over current protective coordination studies to verify there was adequate protection for postulated faults in the DC system.

In addition, the team interviewed system and design engineers, and walked down the 125 Vdc battery bus and distribution panels to independently assess the material condition and determine whether the system alignment and operating environment was consistent with design basis assumptions. Finally, the team reviewed recent corrective action documents and system health reports to determine whether there were any adverse operating trends, and to assess Dominion's capability to evaluate and correct problems.

b. Findings

No findings identified.

.2.1.21 Unit 3 'D' Containment Recirculation Spray System Pump, 3RSS*P1D

a. Inspection Scope

The team inspected the 'D' containment recirculation spray system (RSS) pump to verify that the pump was capable of performing its design basis function. The pump's safety-related function is to provide an adequate supply of spray water for containment depressurization following a design basis LOCA and later during the recirculation mode for core heat removal. The team reviewed the RSS pump NPSH requirements and available NPSH to ensure the pump was capable of fulfilling its safety function at the maximum flowrate assumed and lowest containment sump level. Seismic design documentation was reviewed to verify pump design was consistent with limiting seismic conditions. The team assessed the system hydraulic calculations under LOCA conditions to ensure the pump would provide adequate spray water and that design requirements for flow and pressure were properly translated into IST acceptance criteria. Additionally, the team discussed the RSS pump design, operation, and performance with the engineering staff, and reviewed operator logs to evaluate pump performance. The team evaluated pump performance to ensure there was no degradation by reviewing IST results. The team reviewed design documentation to verify pump motor design was consistent with EQ basis for limiting temperature/radiation conditions. The team conducted a detailed walkdown of the pump and RSS heat exchanger cubicle to assess the material and environmental conditions, and to verify that the installed configuration was consistent with system drawings, and the design and licensing bases. The team reviewed the maintenance history of the pump and system by sampling corrective action condition reports, work orders, and system health reports to ensure there were no adverse trends, and to assess the licensee's ability to identify, evaluate, and correct problems.

b. Findings

No findings were identified.

.2.1.22 Unit 3 'B' Turbine Driven Auxiliary Feedwater Pump Steam Supply Valve, 3MSS*AOV31B

a. Inspection Scope

The team inspected the 'B' turbine driven auxiliary feedwater pump steam supply valve to verify the ability of this valve to perform its design basis functions, including supply of main steam to the turbine driven AFW pump for loss-of-feedwater events. The team reviewed the calculations for maximum differential pressure and the inputs/outputs of the computer programs used to determine required thrust and valve weak link. Diagnostic testing and IST surveillance results, including stroke time and available thrust, were reviewed to verify acceptance criteria were met and performance degradation could be identified. The team reviewed the maintenance and functional history of the valve by sampling corrective action condition reports, the system health report, and preventive maintenance/corrective maintenance records. The team also conducted a detailed walkdown to visually inspect the material condition of the valve and its support systems and to ensure adequate configuration control.

b. Findings

No findings were identified.

2.1.23 Unit 2 and Unit 3 Station Blackout Diesel Generator

a. Inspection Scope

The team inspected the station blackout diesel generator (SBO DG) to verify that is was capable of meeting its design basis requirements. Specific components of the SBO DG reviewed included its DC batteries and the uninterruptible power supply, as well as the quality and storage requirements of the fuel oil. The team reviewed electrical one-line diagrams, piping and instrument diagrams, calculations, and operating procedures to ensure that the SBO DG was operated consistent with its ratings and was capable of operating under design basis conditions. The team reviewed the adequacy of the SBO DG to support the 4.16kV safety busses for Unit 2 and Unit 3, and ensured that surveillance testing adequately verified that the SBO DG was periodically started and tested from a simulated blackout condition of one-hour duration. Design and system engineers were interviewed regarding the design, operation, testing, and maintenance of the diesel generator. The team performed a walkdown of the diesel generator and support systems to assess the material condition of the equipment. Finally, a sample of condition reports was reviewed to ensure Dominion was identifying and properly correcting issues associated with the SBO DG.

b. Findings

No findings were identified.

2.1.24 Unit 3 480 Volt Vital Load Center 32R

a. Inspection Scope

The team inspected the 480 Vac vital load center 32R to verify it was capable of performing its design basis function. The team reviewed electrical distribution calculations including load flow, voltage drop, short-circuit and electrical protection coordination. This review evaluated the adequacy and appropriateness of design assumptions; and verified that load center capacity was not exceeded and voltages remained above minimum acceptable values under design basis conditions. The team reviewed the electrical overcurrent protective relay settings for the supply and selected breakers at the load center to verify that the trip setpoints would not interfere with the ability of the supplied equipment to perform its safety function as assumed in the design basis while ensuring the trip setpoints provided for adequate load center protection. The team reviewed plant operating procedures to verify design limitations were not exceeded for load center crosstie operation and that separation between divisions was maintained consistent with technical specification requirements. The team reviewed system maintenance test results, interviewed system and design engineers, and conducted field walkdowns to verify that equipment alignment, nameplate data, and breaker positions were consistent with design drawings, and to assess the material condition of the load

center. Finally, a sample of condition reports was reviewed to ensure Dominion was identifying and properly correcting issues associated with the 32R load center as well as other 480Vac system components.

b. Findings

No findings were identified.

.2.2 Review of Industry Operating Experience and Generic Issues (4 samples)

The team reviewed selected OE issues for applicability at the Millstone Power Station. The team performed a detailed review of the OE issues listed below to verify that Dominion had appropriately assessed potential applicability to site equipment and initiated corrective actions when necessary.

.2.2.1 NRC Information Notice 2011-14, Component Cooling Water System Gas Accumulation and Other Performance Issues

a. Inspection Scope

The NRC issued information notice (IN) 2011-14 to inform licensees of recent operating experience regarding air intrusion into component cooling water (CCW) systems, as well as other CCW system performance issues. The team reviewed Dominion's evaluation of the susceptibility of the Unit 2 reactor building CCW system and the Unit 3 reactor plant CCW system to these types of problems. Specifically, the team reviewed drawings and procedures, and interviewed engineering staff to determine whether Dominion had fully addressed all the potential issues identified in the information notice.

b. Findings

No findings were identified.

.2.2.2 NRC Information Notice 2008-06, Instrument Air System Failure Resulting In Manual Reactor Trip

a. Inspection Scope

The NRC issued IN 2008-06 to inform licensees of an event involving an instrument air system failure that resulted in a manual reactor trip. The team reviewed Dominion's evaluation of the instrument air system's susceptibility to leaks. Specifically, the team reviewed the condition report and corrective actions related to a similar event that occurred at Millstone Unit 2 prior to the publication of the information notice to determine whether those corrective actions were sufficient to address the potential issues identified in the information notice.

b. Findings

No findings were identified.

.2.2.3 NRC Information Notice 2011-12, Reactor Trips Resulting from Water Intrusion into Electrical Equipment

a. Inspection Scope

The team assessed Dominion's review and follow-up actions to address the issues described in NRC IN 2011-12. This IN described several events where uncorrected water leaks caused electrical faults and grounds that resulted in reactor trips. In two instances, the electrical fault resulted in plant trips with complications because of additional latent design and preventive maintenance deficiencies. Specifically, the team reviewed Dominion's evaluations and follow-up corrective actions for this operating experience item to determine whether Dominion's actions were adequate and appropriate for the described issues.

b. Findings

No findings were identified.

.2.2.4 NRC Information Notice 2010-05, Inadequate Electrical Connections

a. Inspection Scope

The team evaluated Dominion's applicability review and disposition of NRC IN 2010-25. The IN was issued to inform licensees about operating experience regarding inadequate electrical connections that were caused by a variety of deficient maintenance practices. Additionally, the IN described events at four nuclear power plants that occurred from electrical connection problems.

The team assessed Dominion's evaluation of the IN as it applied to the Millstone Power Station, including their review of station practices and procedures to ensure electrical connections were properly reassembled after maintenance, and periodically verified tight and with low resistance consistent with vendor requirements. The inspection included a review of corrective action documents, interviews with engineering and maintenance personnel, and plant walkdowns of the Unit 2 and Unit 3 medium voltage bus ducts. The team verified that Dominion considered all configurations and voltage levels of electrical connections as described in the information notice.

b. Findings

No findings were identified.

## 4. OTHER ACTIVITIES

### 4OA2 Identification and Resolution of Problems (IP 71152)

a. Inspection Scope

The team reviewed a sample of problems that Dominion had previously identified and entered into the corrective action program. The team reviewed these issues to verify an appropriate threshold for identifying issues and to evaluate the effectiveness of corrective actions. In addition, corrective action CRs written on issues identified during the inspection, were reviewed to verify adequate problem identification and incorporation of the problem into the corrective action system. The specific corrective action documents that were sampled and reviewed by the team are listed in the Attachment.

b. Findings

No findings were identified.

### 4OA6 Meetings, including Exit

On May 11, 2012, the team presented the inspection results to Mr. Stephen Scace, Site Vice President, and other members of the Millstone Power Station management. The team reviewed proprietary information, which was returned to Dominion at the end of the inspection. The team verified that no proprietary information was documented in the report.

# ATTACHMENT

# SUPPLEMENTAL INFORMATION

## KEY POINTS OF CONTACT

Dominion Personnel
B. Bartron, Supervisor, Licensing
T. Cleary, Licensing Engineer
J. Craffey, Principal Engineer
K. Deslandes, Supervisor, Engineering
D. Dodson, Supervisor, Engineering
R. Patel, Electrical Design Engineer
J. Rigatti, Manager, Nuclear Engineering
B. Saitta, Electrical Design Engineer

NRC Personnel
C. Cahill, Senior Reactor Analyst
S. Shaffer, Senior Resident Inspector
B. Haagensen, Resident Inspector
J. Krafty, Resident Inspector

## LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

| | | |
|---|---|---|
| Open and Closed | | |
| 05000336/2012007-01 | NCV | Inadequate Assumptions used in Emergency Motor Control Center Control Circuit Voltage Drop Calculation (Section 1R21.2.1.1) |

## LIST OF DOCUMENTS REVIEWED

Audits and Self-Assessments
Audit 10-03: Engineering Programs and Design Control, dated 8/19/10

Calculations & Engineering Evaluations
00-059, MP3 SW System NPSH Calculation, Rev. 0
00-067, MP2 RBCCW Heat Exchanger Testing, Rev. A
006-ST97-C-019, MP2 RBCCW Peak Temperature Analysis, Rev. 1
006-ST97-C-023, Updated CONTRANS LOCA Containment Peak Pressure/Temperature Analysis for Millstone Unit 2, Rev. 1
006-ST97-C-024, MP-2 Containment Related Main Steam Line Break Analysis for FSAR Update, Rev. 02
01-007-008, Seismic Analysis Report, Service Water Pumps, Rev. 3
01-ENG-01884M3, Service Water Cubicle Internal Flooding Evaluation, Rev. 0
03705-US(B)-362, RSS Pump NPSH Requirements, Rev. 0

03-ENG-04035M2, SW System Design Basis Summary Calculation, Rev. 0
04-AOV-04063M3, Actuator Setup Calculation for the Category I Air Operated Valves – MSS System, Rev. 0
05-ENG-04123M3, Boric Acid Storage Tank Volume Delivered to RCS – Post Fire, Rev. 2
09-IST-04441M3, Millstone Unit 3 IST Pump Summary of Design Flow Rates, Rev. 0
12179-953P(B), EDG Enclosure Ventilation, Rev. 2
12179GM-60-03.001CA, 125 VDC Distribution Panel Feeder Breakers Trip Settings, Rev. 0
12179GM-60-03.001CB, Battery Breaker Trip Settings, Rev. 0
12179GM-60-03.405CA, Relay Settings – 600HP Service Water Pump, Rev.1
17272.02-ME(B)-002, Sizing of CST Rupture Discs & Breather Valves, Rev. 1
25203-SP-EE-362, Millstone Unit 2 Station Blackout Safe Shutdown Scenario Document, Rev. 2
25203-SP-M2-SU-1046, MP 2 Appendix R Compliance Report, Rev. 01
3451C01-1187E3, Boric Acid Tank Level Channel Calibration, Rev. 1
84-065-00753GE, 480V Breaker Overcurrent Trip Device, Rev. 2
90-032-0293E2, CST Level Loop Accuracy, Rev. 5
91-019-152M3, Identification of EDG Run Times Under Varying Fuel Oil Levels, dated 1/28/02
92-120, MP2 SWS Design Basis Alignments – Summer & Winter, Rev. 3
96-018, MP2 Service Water Thermal Hydraulic Model, Rev. 1
96-ENG-02172M3, SBO Diesel Generator Run Time, Rev. 1
97-169, MP2 RBCCW – Design Basis Flow Distribution, Rev. 3
97-CST-01999M2, CST Inventory Evaluation, Rev. 1
97-ENG-01768E2, MP2 Pressurizer Pressure Loop Uncertainty, Rev. 1
97-ENG-01773E2, MP2 DC System Analysis, Methodology, & Scenario Development, Rev. 1
97-ENG-01774E2, MP2 Battery 201A & Charger Electrical Verification, Rev. 2
97-ENG-01840E2, MP2 Thermal Overload Relays for MOVs on Safety Related MCCs, Rev. 1
97-ENG-01862M2, RBCCW System Heat Loads and Flow Rates, Rev. 0
97-ENG-0191E2, 4.16kV Switchgear Relay Settings, Rev. 0
98-CST-02644M2, CST Lo-Lo Alarm and AFW Pump NPSH, Rev. 0
98-ENG-02427E2, MP2 LTOP Pressure Setpoints, Rev. 1
98-ENG-02678E2, Cable Size Assessment for Class 1E Cables and Select Non-Class 1E Cables (4160 VAC, 480 VAC, 120 V Vital AC and 125 V DC), Rev. 0
98-ENG-02711M2, Auxiliary Feedwater Pumps Acceptance Curve, Rev. 1
98-TBV-02682M2, Motor Driven Auxiliary Feedwater Pump Room-Maximum Prevailing Room Temperature, Rev. 0
99-517-896-RE, Station Blackout Calculation for NUMARC 87-00, Rev. 2
ANP-2979, MP2 Cycle 21 Safety Analysis Report, Rev. 1
CCN 91-019-152M3, EDG Run Times Under Varying Fuel Oil Levels, dated 3/28/07
CN-PS-06-19, MP2 Mass Addition LTOP Transients, Rev. 2
CN-SEE-I-11-22, Millstone Unit 3 Cycle 15 BORDER Evaluation, dated 8/18/11
DCN DM2-03-0290-02, Setpoint Change DC Bus Ground Detection Meters, dated 11/15/03
DCN DM3-00-0395-08, Revision to 125 VDC Battery Panel Breaker Settings, Rev. 0
DM2-00-0211-07, Replacement of the C CAR Fan/Motor Assembly F14C, dated 3/14/08
DMG-00-0013-07, Implementation of Ultra Low Sulfur Diesel Fuel Oil for the SBO, EOF, Emergency Security and Fire Pump Diesels, dated 8/30/07
DOM-NAF-3-0.0-P-A, GOTHIC Methodology for Analyzing the Response to Postulated Pipe Ruptures Inside Containment, dated 9/06
EEQ-TRA-146.6 Att. C, Target Rock Pilot Operated Relief Valve Diagram, Rev. 0
EQR 146-03, MP2 PORV Equipment Qualification Record, Rev. 1

ER-AA-IST-PMP-101, Att. 1, MDAFW Pump IST Reference Value Evaluation, dated 3/17/10
GSI-191-ECCS-04364M3, MPS3 RSS Pump NPSH with ECCS Strainer and Debris Bed, Rev. 1
ME-696, Seismic Stress Analysis, Containment Recirculation Pumps, dated 3/29/98
MIL3-34325-AR-001, Hydraulic Performance of Replacement Containment Sump Strainers Millstone 3 Power Station, Rev. 2
MIL3-34325-TR-002, Large Scale Testing for Millstone 3 Replacement Containment Sump Strainers, Rev. 0
Millstone Unit 2 Turbine Building High Energy Line Break (HELB) Analysis, Rev. 2
MOV8910-01542E3, GL89-10 MOV Electrical Sizing Calculation, Rev. 1
MP-24-FAP01.2-5, MDAFW Pump Test Data Evaluation, dated 6/18/02
MP2-ENG-ETAP-04014E2, MP2 Electrical Distribution System Analysis, Rev. 1
MP2-SEIS.RPT, Seismic Evaluation Report, Vol. 2, Rev. 0
MP3-ENG-ETAP-04125E3, MP3 Electrical Distribution System Analysis, Rev. 0
P(R)-1015, Reactor Plant Component Cooling Surge Tank Volume, Rev. 0
P(R)-1188, BATP Minimum Flow Orifice Sizing Calculation: 3CHS*RO51A/B, Rev. 0
P(R)-1194, ESF Bldg Flood Study, Rev. 2
P(R)-711, Reactor Plant Component Cooling System Surge Tank Sizing, Rev. 1
PA-079-126-0127E2, MP2 EDG Loading Calculation, Rev. 3
PA-090-050-00308E3, Station Blackout Diesel Generator Loading, Rev. 3
PA-84-065-753GE, 480 Volt Breaker Overcurrent Trip Devices Change Notice 10, Rev. 2
PA-85-082-0812GE, MP3 Breaker and Fuse Coordination, Rev. 3
PA-89-078-272E2, MP2 MOV Voltage Calculation, Rev. 0
PA-91-004-290E2, Emergency MCC Control Circuit Voltage Drop, Rev. 0
PA-91-019-556E3, Ampacity of RSST and NSST Secondary Cables and SBO Diesel Generator and Emergency Generator Leads Installed in Duct Banks, Rev. 1
SP-3CCP-018, Reactor Plant Component Cooling System Surge Tank Low Level Actuation Point, Rev. 2
SP-EE-363, Millstone Unit 3 Station Blackout Safe Shutdown Scenario Document, Rev. 6
SP-M2-ME-1053, MP2 PORV Design Specification, Rev. 2
SP-M3-EE-269, Electrical Design Criteria, Rev. 3
US(B) 249, Determination of Max Water Level Inside Containment Following a LOCA, Rev. 3
US(B) 295, RWST Draw-Down Rates and Switchover Levels, Rev. 8
US(B) 361, Containment Recirc Sys (RSS) and Safety Injection Sys Hydraulic Analysis, Rev. 3
W2-517-1070-RE, MP2 Internal Flooding Evaluation, Rev. 0

Corrective Action Condition Reports

| | | | | |
|---|---|---|---|---|
| 01-10940 | 08-07931 | 331836 | 355387 | 377372 |
| 03-01881 | 175337 | 333889 | 355608 | 377491 |
| 03-06705 | 184727 | 335122 | 355711 | 377690 |
| 05-05495 | 185767 | 336522 | 355758 | 378321 |
| 06-01457 | 185769 | 336563 | 356448 | 384326 |
| 06-01796 | 190642 | 343478 | 356457 | 384765 |
| 06-01846 | 321796 | 346910 | 357890 | 386940 |
| 06-02245 | 322576 | 347899 | 358554 | 389623 |
| 06-10100 | 324466 | 351389 | 358628 | 390010 |
| 07-09015 | 324779 | 352874 | 359175 | 393901 |
| 07-43909 | 328272 | 354930 | 369003 | 394189 |
| 08-07791 | 331635 | 355350 | 377108 | 398042 |

| | | | | |
|---|---|---|---|---|
| 398044 | 422160 | 442623 | 464431 | 473579* |
| 401027 | 422201 | 443513 | 466675 | 473585* |
| 402338 | 422841 | 446706 | 468904 | 473601* |
| 402401 | 423930 | 446913 | 471092* | 473971* |
| 402639 | 424175 | 447207 | 471151* | 474228* |
| 403086 | 424367 | 447236 | 471247* | 474229* |
| 403309 | 425328 | 448553 | 471487* | 474238* |
| 403311 | 432098 | 448592 | 471933* | 474245* |
| 404531 | 432569 | 448648 | 472108* | 474252* |
| 404663 | 433385 | 448844 | 472308* | 474261* |
| 404947 | 434340 | 451123 | 472986* | 474270* |
| 407103 | 434740 | 454096 | 473152* | 474333* |
| 407946 | 435063 | 454235 | 473226* | 474370* |
| 410981 | 435575 | 454237 | 473296 | 474380* |
| 418327 | 436253 | 458475 | 473355 | 474411* |
| 418879 | 436737 | 459071 | 473454* | 474503* |
| 419268 | 439014 | 459385 | 473461* | 474510* |
| 420006 | 441520 | 460241 | 473464* | 474629* |
| 421695 | 442164 | 464007 | 473518* | 474634* |

* CR written as a result of this inspection

Design and Licensing Basis Documents

25203-MP2-SFR, MP2 Safety Functional Requirements Manual, Rev. 8
DBS-2301, MP2 Reactor Coolant System Design Basis Summary, Rev. 0
DBS-2313A, Containment Air Recirculation and Cooling System, Rev. 0
DBS-2319B, MP2 Condensate Storage and Transfer System Design Basis Summary, Rev. 0
DBS-2322, MP2 Auxiliary Feedwater System Design Basis Summary, Rev. 2
DBS-2326A, MP2 Design Basis Summary for the Service Water System, Rev. 1
DBS-2345C, MP2 125VDC Emergency System Design Basis Summary, Rev. 1
DBS-BOP-001, MP3 Service Water System Design Basis Summary, Rev. 1
DBS-EDG-001, MP3 Design Basis Summary Document, EDG Engine, Rev. 1
DBS-EDG-003, MP3 Design Bases Summary for the Station Blackout Diesel Generator, Rev. 1
DBS-ELE-005, MP3 125 VDC Electrical Distribution System Design Basis Summary, Rev. 1
DBS-NSS-003, MP3 Recirculation Spray System Design Basis Summary, Rev. 1
DBS-NSS-005, MP3 Design Basis Summary for the Emergency Core Cooling System, Rev.0
DBS-NSS-007, MP3 Design Basis Summary for the Reactor Plant Component Cooling Water System, Rev. 0
DM2-00-0189-07, Update to DBS-2301, dated 10/29/09

Drawings

2214.802-044-021, MP3 RSS Pump Characteristic Curves, Rev. C
2472110-185-241, Stm Sply Vlv to Aux FD Pmp, Rev B
25203-11017, MP2 Misc. Yard Foundation (CST), Rev. 3
25203-13006, Sh. 21, MP2 Condensate Storage Tank, Rev. 6
25203-26002, Sh. 1, MP2 Main Steam from Generators, Rev. 7
25203-26005, Sh. 3, MP2 Condensate Storage & Aux. Feed, Rev. 57
25203-26008, Sh. 2, MP2 Service Water, Rev. 99
25203-26009, Sh. 5, MP2 Instrument Air System, Rev. 33

25203-26014, Sh. 2, MP2 Reactor Coolant System, Rev. 41
25203-26022, Sh. 5, MP2 RBCCW System Cntmt Air Recirc and Coolant Unit, Rev. 26
25203-26022, Sh. 1, MP2 RBCCW System, Rev. 45
25203-26027, Sh. 1, MP2 HVAC System TB, Intake Structure, WHSE & EDG Rooms, Rev. 48
25203-28406, Sh. 25, MP2 CST Level Control Level Setting Diagram, Rev. 5
25203-28500, Sh.99D, MP2 TE-121Y, TE-125, and PT-103 Cold Leg Temp. to Reactor LOOP Diagram, Rev. 7
25203-29004, Sh. 19B, MP2 General Arrangement Cooling Water Exchanger Replacement Channels, Rev. 2
25203-29004, Sh. 22, MP2 Reactor Building Component Cooling Water Heat Exchanger, Rev. 1
25203-29004, Sh. 54, MP2 RBCCW Heat Exchanger Bill of Material, Rev. 4
25203-29008, Sh. 33, MP2 MDAFW Pump General Assembly, Rev. B
25203-29052, Sh. 1, MP2 34" 600# W.E. Main Steam Swing Disc Trip Valve – Air Cylinder Operated, Rev. 13
25203-29052, Sh. 2, MP2 Schematic Diagram of Air Control System for MSSV, Rev. 4
25203-29087, Sh. 1, MP2 Model D-100-160 Operator 8" 600 lb. A.N.S.I. Valve Assembly, Rev. 7
25203-30011, MP2 Emergency MCC B61 (22-1F) Facility Z2 Load Summary Aux Building, Rev.13
25203-30022, Sh. 1, MP2 TB, (DV10) 125 VDC Distribution Summary, Rev. 6
25203-30022, Sh. 3, MP2 TA, (DV20) 125 VDC Distribution Summary, Rev. 5
25203-30024, MP2 125 VDC System Single Line Diagram, Rev. 32
25203-30078, MP3 125 VDC System Single Line Diagram, Rev. 32
25203-30107, Sh. 1, MP2 125 VDC Load Center Circuit Breaker Settings, Rev. 2
25203-30107, Sh. 2, MP2 125 VDC Load Center Circuit Breaker Settings, Rev. 1
25203-30107, Sh. 3, MP2 125 VDC Load Center Circuit Breaker Settings, Rev. 3
25203-32002, Sh. 15, 4.16kV Main Feeder Breaker 34B-24E-2 (A505), Rev. 1
25203-32002, Sh. 15A, 4.16kV Main Feeder Breaker 34B-24E-2 (A505), Rev. 1
25203-32007, Sh. 23 & 24, MP2 Pressurizer Relief RC402/404 Schematic, Rev. 12
25203-32007, MP2 Pressurizer Relief SOV RC402, Rev. 12
25203-32008, Sh. 33, MP2 Shutdown Cooling Isolation MOV SI652, Rev. 16
25203-32011, Sh. 57, MP2 B Containment Air Recirc Fan 14B, Rev. 6
25203-32022, Sh. 3, MP2 Ctmt Air Recirc Fan MF14B Control, Rev. 15
25203-32041, Sh. 1, MP2 4 kV Diesel Generator Breaker Schematic, Rev. 13
25203-32041, Sh. 16, MP2 4.16KV Diesel Generator Engine Controls 15G-13U-2 (H4B), Rev. 10
25203-32041, Sh. 19, MP2 4.16KV Diesel Generator Engine Controls15G-13U-2 (H4B), Rev. 10
25203-32041, Sh. 2, 4.16KV DG Feeder Breaker 15G-13U-2 (H4B) (A401), Rev. 15
25212-26904, Sh. 3, MP3 Chemical Volume and Control, Rev. 32
25212-26912, Sh. 3, MP3 Low Pressure Safety Injection/Containment Recirculation, Rev. 38
25212-26913, Sh. 2, MP3 High Pressure Safety Injection, Rev. 39
25212-26916, Sh. 1, MP3 EDG 'A' Lube Oil and Cooling Water, Rev. 43
25212-26916, Sh. 2, MP3 EDG 'A' Starting Air System, Rev. 37
25212-26916, Sh. 5, MP3 EDG Exhaust, Combustion Air, and Vacuum System, Rev. 9
25212-26917, MP3 EDG Fuel Oil System, Rev. 23
25212-26921, Sh. 1, MP3 Reactor Plant Component Cooling System, Rev. 32
25212-26921, Sh. 2, MP3 Reactor Plant Component Cooling System, Rev. 20
25212-26921, Sh. 3, MP3 Reactor Plant Component Cooling System, Rev. 35
25212-26923, Sh. 1, MP3 Main Steam and Reheat, Rev. 51
25212-26930, Sh. 2, MP3 Feedwater System, Rev. 44

25212-26933, Sh. 1, MP3 Service Water, Rev. 44
25212-26933, Sh. 2, MP3 Service Water, Rev. 70
25212-26933, Sh. 4, MP3 Service Water, Rev. 44
25212-26958, Sh. 1, MP3 Station Blackout Lube Oil System, Rev. 10
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| 53102183028 | 53102337558 | 53102374325 | 53M20508452 |
| 53102191136 | 53102338019 | 53102374326 | 53M20605438 |
| 53102196797 | 53102342631 | 53102376770 | 53M20606884 |
| 53102196814 | 53102343679 | 53102380460 | 53M20606991 |
| 53102198814 | 53102351550 | 53102425458 | 53M20607028 |
| 53102198908 | 53102351552 | 53102448099 | 53M20607801 |
| 53102202472 | 53102354589 | 53102452215 | 53M20608474 |
| 53102239514 | 53102355597 | 53102459616 | 53M20608772 |
| 53102251885 | 53102355911 | 53102477545 | 53M20608811 |
| 53102258966 | 53102360001 | 53102504966 | 53M20702536 |
| 53102259203 | 53102360504 | 53M20405586 | 53M20702559 |
| 53102259509 | 53102360505 | 53M20407626 | 53M20702560 |
| 53102286330 | 53102365355 | 53M20411639 | 53M20704499 |
| 53102293003 | 53102365357 | 53M20411768 | 53M20709489 |
| 53102301064 | 53102368401 | 53M20501820 | 53M20803086 |
| 53102317239 | 53102370762 | 53M20502841 | 53M20807377 |
| 53102325832 | 53102372032 | 53M20504128 | 53M20808949 |

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| 53M22060691 | 53M30613902 | 53M30807734 | M30021973 |
| 53M29012571 | 53M30703483 | M20406522 | M30022078 |
| 53M29507877 | 53M30704066 | M20406523 | M30022087 |
| 53M30114687 | 53M30704357 | M20704977 | M30312700 |
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| 53M30406040 | 53M30711573 | M20L755L1 | M30710667 |
| 53M30608749 | 53M30704495 | | |

## LIST OF ACRONYMS

| | |
|---|---|
| AC | Alternating Current |
| ADAMS | Agencywide Documents Access and Management System |
| ADV | Atmospheric Dump Valve |
| AFW | Auxiliary Feedwater |
| BATP | Boric Acid Transfer Pump |
| CAR | Containment Air Recirculation |
| CCW | Component Cooling Water |
| CDBI | Component Design Bases Inspection |
| CPT | Control Power Transformer |
| CR | Condition Report |
| CST | Condensate Storage Tank |
| DBA | Design Basis Accident |
| DC | Direct Current |
| DG | Diesel Generator |
| DRS | Division of Reactor Safety |
| DRP | Division of Reactor Projects |
| EDG | Emergency Diesel Generator |
| EOP | Emergency Operating Procedure |
| EQ | Environmental Qualification |
| IMC | Inspection Manual Chapter |
| IN | Information Notice |
| IP | Inspection Procedure |
| IST | In-Service Test |
| kV | Kilovolt |
| LERF | Large Early Release Frequency |
| LOCA | Loss-of-Coolant Accident |
| MSIV | Main Steam Isolation Valve |
| MCC | Motor Control Center |
| NCV | Non-cited Violation |
| NPSH | Net Positive Suction Head |
| NRC | Nuclear Regulatory Commission |
| OE | Operating Experience |
| PORV | Power Operated Relief Valve |
| PRA | Probabilistic Risk Assessment |
| RAW | Risk Achievement Worth |
| RBCCW | Reactor Building Component Cooling Water |
| RPCCW | Reactor Plant Component Cooling Water |

| | |
|---|---|
| RRW | Risk Reduction Worth |
| RSS | Recirculation Spray System |
| SBO | Station Blackout |
| SDP | Significance Determination Process |
| SPAR | Standardized Plant Analysis Report |
| SW | Service Water |
| TDH | Total Dynamic Head |
| TRM | Technical Requirements Manual |
| TS | Technical Specification |
| UFSAR | Updated Final Safety Analysis Report |
| VAC | Volts, Alternating Current |
| VDC | Volts, Direct Current |

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 21, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Nuclear Connecticut, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION, UNITS 2 AND 3 - CLOSEOUT OF BULLETIN 2011-01, "MITIGATING STRATEGIES" (TAC NOS. ME6450 AND ME6451)

On May 11, 2011, the U.S. Nuclear Regulatory Commission (NRC) issued Bulletin 2011-01, "Mitigating Strategies" (Agencywide Documents Access and Management System (ADAMS) Accession No. ML111250360), to all holders of operating licenses for nuclear power reactors, except those that have permanently ceased operation and have certified that fuel has been removed from the reactor vessel. The purpose of the bulletin was to obtain a comprehensive verification that licensees' mitigating strategies to maintain or restore core cooling, spent fuel cooling, and containment following a large explosion or fire were compliant with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.54(hh)(2).

The bulletin required two sets of responses pursuant to the provisions of 10 CFR 50.54(f). Millstone Power Station, Units 2 and 3, provided its responses to the bulletin by letters dated June 9 and July 8, 2011 (ADAMS Accession Nos. ML11172A189 and ML11193A266). By letter dated December 8, 2011 (ADAMS Accession No. ML113340035), the NRC sent the licensee a request for additional information (RAI) on its July 8, 2011, response. The licensee responded to the RAI by letter dated January 9, 2012 (ADAMS Accession No. ML12012A103).

The NRC staff has performed the enclosed review of the information submitted by the licensee and concludes that the licensee has provided the information requested in the bulletin. The licensee has responded to each of the questions in the bulletin as requested.

Based on its review, the NRC staff concludes that the licensee has completed all of the requirements of the bulletin and no further information or actions under the bulletin are needed.

Activities for TAC Nos. ME6450 and ME6451 are complete, and the TACs have been closed.

Please contact me at (301) 415-4125 if you have any questions on this issue.

Sincerely,

James Kim

James Kim, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-336 and 50-423

Enclosure: Staff Evaluation

cc w/encl: Distribution via Listserv

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

STAFF REVIEW BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO BULLETIN 2011-01

RENEWED FACILITY OPERATING LICENSE NOS. DPR-65 AND NPF-49

DOMINION NUCLEAR CONNECTICUT, INC

MILLSTONE POWER STATION UNITS 2 AND 3

DOCKET NOS. 50-336 AND 50-423

## 1.0 INTRODUCTION

On May 11, 2011, the U.S. Nuclear Regulatory Commission (NRC) issued Bulletin 2011-01, "Mitigating Strategies," (Agencywide Documents Access and Management System (ADAMS) Accession No. ML111250360) to all holders of operating licenses for nuclear power reactors, except those that have permanently ceased operation and have certified that fuel has been removed from the reactor vessel. The bulletin required two sets of responses pursuant to the provisions of Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.54(f). The first responses were due 30 days after issuance of the bulletin. By letter dated June 9, 2011 (ADAMS Accession No. ML11172A189), Millstone Power Station (MPS), Units 2 and 3, provided its response to this first set of questions (first response). The second responses were due 60 days after issuance of the bulletin. By letter dated July 8, 2011 (ADAMS Accession No. ML11193A266), MPS provided its response to this second set of questions (second response). By letter dated December 8, 2011 (ADAMS Accession No. ML113340035), the NRC sent a request for additional information (RAI) on the second response. MPS responded to the RAI by letter dated January 9, 2012 (ADAMS Accession No. ML12012A103). As summarized below, the NRC staff has verified that MPS provided the information requested in the bulletin.

## 2.0 BACKGROUND

On February 25, 2002, the NRC issued EA-02-026, "Order for Interim Safeguards and Security Compensatory Measures" (ICM Order). Section B.5.b of the ICM Order required licensees to develop specific guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities using readily available resources (equipment and personnel) that can be effectively implemented under the circumstances associated with the loss of large areas of the plant due to explosions or fire.

By letter dated July 18, 2007 (ADAMS Accession No. ML071970005), the NRC staff issued its Safety Evaluation (SE) to document the final disposition of information submitted by MPS regarding Section B.5.b of the ICM Order. Along with the SE, the staff issued a conforming license condition to incorporate the B.5.b mitigating strategies into the licensing basis.

On March 27, 2009, the NRC issued 10 CFR 50.54(hh)(2) as a new rule, in order to capture the B.5.b mitigating strategies and related license conditions as regulatory requirements for both current and future licensees. At that time, licensee compliance with the conforming license conditions was sufficient to demonstrate compliance with 10 CFR 50.54(hh)(2) (74 FR 13926) so no further actions were required on the part of current licensees.

## 3.0 30-DAY RESPONSE

In order to confirm continued compliance with 10 CFR 50.54(hh)(2), the bulletin requested that licensees address the following two questions within 30 days of issuing the bulletin:

Question 1 Is the equipment necessary to execute the mitigating strategies, as described in your submittals to the NRC, available and capable of performing its intended function?

Question 2 Are the guidance and strategies implemented capable of being executed considering the current configuration of your facility and current staffing and skill levels of the staff?

The NRC staff reviewed MPS's first response to determine if it had adequately addressed these questions.

Question 1: Availability and Capability of Equipment

In its first response, MPS confirmed that equipment it needs to execute the 10 CFR 50.54(hh)(2) mitigating strategies is available and capable of performing its intended function. The NRC staff verified that this confirmation covered equipment needed for each of the three phases of B.5.b mitigation strategies. Therefore, the NRC staff finds that MPS has adequately responded to Question 1.

Question 2: Guidance and Strategies Can Be Executed

In its first response, MPS confirmed that the guidance and strategies it has implemented for 10 CFR 50.54(hh)(2) are capable of being executed considering the current facility configuration, staffing levels, and staff skills. Since MPS has considered its current facility configuration, staffing levels, and staff skills, and confirmed that it can execute its implemented guidance and strategies, the NRC staff finds that MPS has adequately responded to Question 2.

## 4.0 60-DAY RESPONSE

The bulletin required a response to the following five questions within 60 days of issuing the bulletin:

Question 1 Describe in detail the maintenance of equipment procured to support the strategies and guidance required by 10 CFR 50.54(hh)(2) in order to ensure that it is functional when needed.

Question 2 Describe in detail the testing of equipment procured to support the strategies and guidance required by 10 CFR 50.54(hh)(2) in order to ensure that it will function when needed.

Question 3 Describe in detail the controls for ensuring that the equipment is available when needed.

Question 4 Describe in detail how configuration and guidance management is ensured so that strategies remain feasible.

Question 5 Describe in detail how you ensure availability of offsite support.

The NRC staff reviewed MPS's submittals to determine if it had adequately addressed these questions. This was accomplished by verifying that the submittals listed equipment, training, and offsite resources which were relied upon to make conclusions in the July 18, 2007, SE or are commonly needed to implement the mitigating strategies.

Questions 1 and 2: Maintenance and Testing of Equipment

Questions 1 and 2 of the 60-day request required licensees to describe in detail the maintenance and testing of equipment procured to support the strategies and guidance required by 10 CFR 50.54(hh)(2) in order to ensure that it is functional when needed. In its second response, MPS listed the equipment used to support the 10 CFR 50.54(hh)(2) mitigating strategies which receives maintenance or testing. For each item, MPS described the maintenance and testing performed, including the frequency and basis for the maintenance or testing activity.

The NRC staff verified that MPS listed equipment that typically requires maintenance or testing which was relied upon to make conclusions in the SE or commonly needed to implement the mitigating strategies. In its second response, MPS stated that the portable pump, hoses, nozzles, and communications equipment receive maintenance or testing. In its RAI response, MPS described how it ensures sufficient fuel for the portable pump. MPS also identified other items that support the mitigating strategies that receive maintenance or testing.

The NRC staff verified that MPS described the process used for corrective actions and listed the testing performed to ensure that the strategies were initially feasible. MPS stated in its second response that its 10 CFR Part 50, Appendix B, corrective action program is used to document equipment failure, establish priorities, and perform trending. In the RAI, the NRC asked MPS to clarify how it initially verified the feasibility of using portable sprays to mitigate a release coming from a damaged or failed containment. In its RAI response, MPS stated that it had made an error in the second response and described its strategy for using portable sprays to mitigate releases and how this strategy was verified.

Based upon the information above, the NRC staff finds that MPS has provided the information requested by Questions 1 and 2.

Question 3: Controls on Equipment

Question 3 of the 60-day request required licensees to describe in detail the controls on equipment, such as inventory requirements, to ensure that the equipment is available when needed. A list of inventory deficiencies and associated corrective actions to prevent loss was also requested.

The NRC staff verified that MPS described its process for ensuring that B.5.b equipment will be available when needed. In its second response, MPS identified equipment included in its inventory, the inventory frequency, storage requirements, and items verified. Items verified include proper quantity, location, and accessibility of equipment; calibrations; equipment shelf lives; and controls on storage locations. MPS states that at the time of its second response there were no outstanding inventory deficiencies that would render the strategies not viable.

The NRC staff verified that MPS inventoried equipment which was relied upon to make conclusions in the SE or commonly needed to implement the mitigating strategies. In its second response, MPS stated that procured non-permanently installed B.5.b equipment is inventoried in accordance with station procedures. The NRC staff noted that all items specifically listed were inventoried at least quarterly. The second response specifically states that the following items are included in the inventory: portable pump; tow vehicle; hoses; communications equipment; nozzles; connectors; tools; and firefighter turnout gear. MPS also identified other items that support the mitigating strategies that are inventoried.

Based upon the information above, the NRC staff finds that MPS has provided the information requested by Question 3.

Question 4: Configuration and Guidance Management

Question 4 of the 60-day request required licensees to describe in detail how configuration and guidance management is assured so that the strategies remain feasible.

The NRC staff verified that MPS described its measures to evaluate plant configuration changes for their effects on the mitigating strategies and to ensure its procedures are current. In its second response, MPS stated that plant configuration changes are procedurally evaluated against the licensing basis, which includes the B.5.b mitigating strategies. MPS states that the design change process requires a review of affected procedures and that procedure changes are validated to ensure that the B.5.b mitigating strategies remain viable.

The NRC staff verified that MPS described measures it has taken to validate the procedures or guidelines developed to support the mitigating strategies. In its second response, MPS identified testing in response to Question 2 that demonstrated the ability to execute some strategies. MPS also states that "initially, mitigating strategies were validated by walk-downs, engineering evaluations and table top reviews" and they were similarly revalidated in 2011.

The NRC staff verified that MPS described the training program implemented in support of the mitigating strategies and how its effectiveness is evaluated. In its second response, MPS identified the training provided to its operations personnel, emergency response organization key decision makers, security personnel, fire brigade, and other personnel. MPS also identified

the frequency with which each type of training is provided and the methods for evaluating the training.

Based upon the information above, the NRC staff finds that MPS has provided the information requested by Question 4.

Question 5: Offsite Support

Question 5 of the 60-day request required licensees to describe in detail how offsite support availability is assured.

The NRC staff verified that MPS listed the offsite organizations it relies upon for emergency response, including a description of agreements and related training. The NRC staff compared the list of offsite organizations that MPS provided in its second response with the information relied upon to make conclusions in the SE. MPS stated that it maintains memorandum of understanding or other types of agreements with these offsite organizations, which are reviewed annually, and that these agreements were current at the time of its second response. MPS also described the training and site familiarization it provides to these offsite organizations. MPS stated that it reviewed its corrective action program back to 2008 and found no issues involving lapsed agreements related to offsite support for B.5.b events.

Based upon the information above, the NRC staff finds that MPS has provided the information requested by Question 5.

## 5.0 CONCLUSION

As described above, the NRC staff has verified that MPS has provided the information requested in Bulletin 2011-01. Specifically, MPS responded to each of the questions in the bulletin as requested. The NRC staff concludes that MPS has completed all of the requirements of the bulletin and no further information or actions under the bulletin are needed.

Principal Contributor: B. Purnell

Date: June 21, 2012

Please contact me at (301) 415-4125 if you have any questions on this issue.

Sincerely,

/RA/

James Kim, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-336 and 50-423

Enclosure: Staff Evaluation

cc w/encl: Distribution via Listserv

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ADAMS Accession No.: ML12172A060

| OFFICE | LPL1-1/PM | LPL1-1/LA | LPL1-1/BC |
|---|---|---|---|
| NAME | JKim | KGoldstein | GWilson |
| DATE | 6/21/12 | 6/20/12 | 6/21/12 |

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 27, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Nuclear Connecticut, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION, UNIT 2 - ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT (TAC NO. ME6693)

Dear Mr. Heacock:

Enclosed is a copy of the Environmental Assessment and Finding of No Significant Impact related to your application for exemption dated June 30, 2011, as supplemented by letter dated February 29, 2012.

The proposed exemption would allow operator manual actions in lieu of meeting the circuit separation and protection requirements contained in Title 10 of the *Code of Federal Regulations* Part 50, Appendix R, Section III.G.2 for 13 plant fire areas.

The environmental assessment is being forwarded to the Office of the Federal Register for publication.

Sincerely,

James Kim, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-336

Enclosure:
Environmental Assessment

cc w/encl: Distribution via Listserv

[7590-01-P]

NUCLEAR REGULATORY COMMISSION

DOMINION NUCLEAR CONNECTICUT, INC.

DOCKET NO. 50-336

MILLSTONE POWER STATION, UNIT 2

ENVIRONMENTAL ASSESSMENT AND FINDING OF

NO SIGNIFICANT IMPACT

The U.S. Nuclear Regulatory Commission (NRC or the staff) is considering issuance of an exemption from the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," for Facility Operating License No. DPR-65 issued to Dominion Nuclear Connecticut, Inc. (DNC or the licensee), for operation of the Millstone Power Station, Unit 2 (MPS2) located in town of Waterford, CT. Therefore, as required by 10 CFR 51.21, the NRC performed an environmental assessment. Based on the results of the environmental assessment, the NRC is issuing a finding of no significant impact.

ENVIRONMENTAL ASSESSMENT

Identification of the Proposed Action:

DNC proposed that the NRC grant exemptions to certain NRC requirements pertaining to the NRC fire regulations. The proposed action is detailed in the licensee's application dated June 30, 2011, as supplemented by letter dated February 29, 2012. The licensee's application and supplemental submission are accessible electronically from the NRC's Agencywide Documents Access and Management System (ADAMS) with Accession Nos. ML11188A213 and ML12069A016.

Regulatory Issue Summary (RIS) 2006-10, "Regulatory Expectations With Appendix R Paragraph III.G.2 Operator Manual Actions," documents the NRC position on the use of operator manual actions (OMAs) as part of a compliance strategy to meet the requirements of 10 CFR Part 50, Appendix R, Section III.G.2. The NRC requires plants which credit manual actions for 10 CFR Part 50, Appendix R, Section III.G.2 compliance to obtain NRC approval for the manual actions using the exemption process in accordance with the requirements of 10 CFR 50.12. In response, the licensee proposed this licensing action which would exempt MPS2 from certain requirements of 10 CFR Part 50, Appendix R, Section III.G.2.

DNC proposed a number of OMAs in lieu of one of the means specified in Section III.G.2 to ensure a train of equipment used for hot shutdown is available when redundant trains are in the same fire area. Therefore, DNC requested exemptions from the requirements of 10 CFR Part 50, Appendix R, Paragraph III.G.2 for MPS2 to the extent that OMAs are necessary to achieve and maintain hot shutdown for fire areas in which both trains of safe-shutdown cables or equipment are located in the same fire area.

The Need for the Proposed Action:

The proposed action is requested to permit the licensee an alternate method from those specified in 10 CFR Part 50, to achieve and maintain hot shutdown conditions in the event of a fire that could disable electrical cables and equipment in the fire areas of MPS2 listed in the licensee's request for exemption.

The criteria for granting specific exemptions from 10 CFR Part 50 regulations are specified in 10 CFR 50.12. In accordance with 10 CFR 50.12(a)(1), the NRC is authorized to grant an exemption upon determining that the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security.

Environmental Impacts of the Proposed Action:

The NRC has completed its evaluation of the environmental impact of the proposed action. The staff has concluded that such actions would not adversely affect the environment. The proposed action would not result in an increased radiological hazard. There will be no change to the radioactive effluent releases that effect radiation exposures to plant workers and members of the public. No changes will be made to plant structures or the site property. Therefore, no changes or different types of radiological impacts are expected as a result of the proposed exemption.

The proposed action does not result in changes to land use or water use, or result in changes to the quality or quantity of non-radiological effluents. No changes to the National Pollution Discharge Elimination System permit are needed. No effects on the aquatic or terrestrial habitat in the vicinity or the plant, or to threatened, endangered, or protected species under the Endangered Species Act, or impacts to essential fish habitat covered by the Magnuson-Stevens Fisheries Management Act are expected. There are no impacts to historical and cultural resources. There would be no impact to socioeconomic resources. Therefore, no changes or different types of non-radiological environmental impacts are expected as a result of the proposed exemption.

Accordingly, the NRC concludes that there are no significant environmental impacts associated with the proposed action. The details of the staff's safety evaluation will be provided in the exemption, when it is issued.

Environmental Impacts of the Alternatives to the Proposed Action:

As alternatives to the proposed action, the NRC staff is considering denial of the proposed action (i.e., the "no-action" alternative) or requiring the licensee to modify the facility to achieve compliance with Appendix R. Denial of the application would result in no change in

current environmental impacts. The environmental impacts of the proposed action and the alternative action are similar.

Alternative Use of Resources:

The action does not involve the use of any different resources than those previously considered in the U.S. Atomic Energy Commission's 1973 "Final Environmental Statement Related to the Continuation of Construction of Unit 2 and the Operation of Units 1 and 2, Millstone Nuclear Power Station."

Agencies and Persons Consulted:

On May 14, 2012, the staff consulted with the Connecticut State official, Michael Firsick of the Department of Environmental Protection, regarding the environmental impact of the proposed action. Mr. Firsick had no comments.

FINDING OF NO SIGNIFICANT IMPACT

On the basis of the environmental assessment, the NRC concludes that the proposed action will not have a significant effect on the quality of the human environment. Accordingly, the NRC has determined not to prepare an environmental impact statement for the proposed action.

For further details with respect to the proposed action, see the licensee's application dated June 30, 2011, as supplemented by letter dated February 29, 2012. The licensee's application and supplemental submission are accessible electronically from the ADAMS with Accession Nos. ML11188A213 and ML12069A016. Publicly available versions of the documents may be examined, and/or copied for a fee, at the NRC's Public Document Room (PDR), located at One White Flint North, Public File Area O1-F21, 11555 Rockville Pike (first floor), Rockville, Maryland. Publicly available documents created or received at the NRC are

accessible electronically through the ADAMS in the NRC Library at http://www.nrc.gov/reading-rm/adams.html. Persons who do not have access to ADAMS or who encounter problems in accessing the documents located in ADAMS should contact the NRC PDR Reference staff by telephone at 1-800-397-4209 or 301-415-4737, or send an e-mail to pdr.resource@nrc.gov.

Dated at Rockville, Maryland, this 27th day of June 2012.

FOR THE NUCLEAR REGULATORY COMMISSION

James Kim

James Kim, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

June 27, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Nuclear Connecticut, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION, UNIT 2 - ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT (TAC NO. ME6693)

Dear Mr. Heacock:

Enclosed is a copy of the Environmental Assessment and Finding of No Significant Impact related to your application for exemption dated June 30, 2011, as supplemented by letter dated February 29, 2012.

The proposed exemption would allow operator manual actions in lieu of meeting the circuit separation and protection requirements contained in Title 10 of the *Code of Federal Regulations* Part 50, Appendix R, Section III.G.2 for 13 plant fire areas.

The environmental assessment is being forwarded to the Office of the Federal Register for publication.

Sincerely,
***/ra/***
James Kim, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-336

Enclosure:
Environmental Assessment

cc w/encl: Distribution via Listserv

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**ADAMS Accession Nos: Package: ML121320568; Letter: ML121320574; EA: ML121320576**

| OFFICE | NRR/LPL1-1/PM | NRR/LPL1-1/LA | NRR/DLR/RERB/BC |
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| DATE | 5/14/12 | 5/14/12 | 5/15/12 |
| OFFICE | OGC | NRR//LPL1-1/BC | NRR/LPL1-1/PM |
| NAME | LSubin | GWilson | JKim |
| DATE | 6/26/12 | 6/27/12 | 6/27/12 |

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 9, 2012

Mr. Dale A. Rocheleau
Senior Vice President, General Counsel
& Corporate Secretary
Central Vermont Public Service Corporation
77 Grove St.
Rutland, VT 05701

SUBJECT: MILLSTONE POWER STATION, UNIT 3 - NOTICE OF CONSIDERATION OF APPROVAL OF TRANSFER OF FACILITY OPERATING LICENSE CONFORMING AMENDMENT AND OPPORTUNITY FOR A HEARING (TAC NO. ME8968)

Dear Mr. Rocheleau:

Enclosed is a copy of a "Notice of Consideration of Approval of Transfer of Facility Operating License, Conforming Amendment, and Opportunity for a Hearing," related to the application dated September 9, 2011, as supplemented by letters dated November 4, 2011, April 6, 2012, May 4, 2012, and June 26, 2012,[1] filed by Central Vermont Public Service Corporation (CVPS). The application, pursuant to 10 CFR 50.80, seeks U.S. Nuclear Regulatory Commission (NRC) approval of the proposed transfer of control of Central Vermont Public Service Corporation (CVPS)' interest in the license for the Millstone Power Station, Unit 3 (MPS3) resulting from a subsequent restructuring in which CVPS will be consolidated with Gaz Métro Limited Partnership (Gaz Métro)'s existing U.S. subsidiary Green Mountain Power Corporation (GMP). The NRC is also considering amending the license for administrative purposes to reflect the proposed transfer.

This notice is being forwarded to the Office of the Federal Register for publication.

Sincerely,

James Kim

James Kim, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-423

Enclosure:
Notice

cc w/encl: see next page

[1] Agencywide Documents Access and Management System Accession Nos. ML11256A051, ML11311A148, ML12100A017, ML12128A433, and ML12180A123 respectively.

Letter to Dale A. Rocheleau from James Kim dated July 9, 2012

SUBJECT: MILLSTONE POWER STATION, UNIT 3 - NOTICE OF CONSIDERATION OF APPROVAL OF TRANSFER OF FACILITY OPERATING LICENSE CONFORMING AMENDMENT AND OPPORTUNITY FOR A HEARING (TAC NO. ME8968)

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7590-01-P

UNITED STATES NUCLEAR REGULATORY COMMISSION

CENTRAL VERMONT PUBLIC SERVICE CORPORATION

MILLSTONE POWER STATION, UNIT NO. 3

DOCKET NO. 50-423

NOTICE OF CONSIDERATION OF

APPROVAL OF TRANSFER OF FACILITY OPERATING LICENSE, CONFORMING

AMENDMENT AND OPPORTUNITY FOR A HEARING

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Notice of request for license transfer and conforming license, opportunity to comment, opportunity to request a hearing.

**DATES:** Comments must be filed by **[INSERT DATE: 30 DAYS FROM DATE OF PUBLICATION OF THIS FEDERAL REGISTER NOTICE]**. A request for a hearing must be filed by **[INSERT DATE: 20 DAYS FROM DATE OF PUBLICATION OF THIS FEDERAL REGISTER NOTICE]**.

**ADDRESSES:** Please include Docket ID **NRC-20XX-XXXX** in the subject line of your comments. Comments submitted in writing or in electronic form will be posted on the NRC Web site and on the Federal rulemaking Web site http://www.regulations.gov. Because your comments will not be edited to remove any identifying or contact information, the NRC cautions you against including any information in your submission that you do not want to be publicly disclosed.

The NRC requests that any party soliciting or aggregating comments received from other persons for submission to the NRC inform those persons that the NRC will not edit their

comments to remove any identifying or contact information, and therefore, they should not include any information in their comments that they do not want publicly disclosed.

You may submit comments by any one of the following methods.

**Federal Rulemaking Web Site:** Go to http://www.regulations.gov and search for documents filed under Docket ID **NRC-20XX-XXXX.** Address questions about NRC dockets to Carol Gallagher 301-492-3668; e-mail Carol.Gallagher@nrc.gov.

**Mail comments to:** Chief, Rules, Announcements, and Directives Branch (RADB), Office of Administration, Mail Stop: TWB-05-B01M, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

**Fax comments to:** RADB at 301-492-3446.

You can access publicly available documents related to this notice using the following methods:

**NRC's Public Document Room (PDR):** The public may examine and have copied, for a fee, publicly available documents at the NRC's PDR, O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

**NRC's Agencywide Documents Access and Management System (ADAMS):** Publicly available documents created or received at the NRC are available online in the NRC Library at http://www.nrc.gov/reading-rm/adams.html. From this page, the public can gain entry into ADAMS, which provides text and image files of the NRC's public documents. If you do not have access to ADAMS or if there are problems in accessing the documents located in ADAMS, contact the NRC's PDR reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to pdr.resource@nrc.gov. The application dated September 9, 2011, as supplemented by letters dated November 4, 2011, April 6, 2012, May 4, 2012 and June 26, 2012 are available electronically under ADAMS Accession Nos. ML11256A051, ML11311A148, ML12100A017, ML12128A433 and ML12180A123, respectively.

**FOR FURTHER INFORMATION CONTACT:** James Kim, Project Manager, Plant Licensing Branch I-1, Division of Operating Reactor Licensing, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555. Telephone: 301-415-4125: fax number: 301-415-2102; e-mail: james.kim@nrc.gov.

**Background**

The U.S. Nuclear Regulatory Commission (the Commission) is considering the issuance of an order under 10 CFR 50.80 approving the transfer of control of Central Vermont Public Service Corporation (CVPS)' interest in the Renewed Facility Operating License (No. NPF-49) for the Millstone Power Station, Unit 3 (MPS3) resulting from a subsequent restructuring in which CVPS will be consolidated with Gaz Métro Limited Partnership (Gaz Métro)'s existing U.S. subsidiary Green Mountain Power Corporation (GMP). The Commission is also considering amending the license for administrative purposes to reflect the proposed transfer. By Order dated June 15, 2012, the Commission approved the indirect transfer of control of CVPS' 1.7303% interest in the license for MPS3 resulting from the acquisition of CVPS by Gaz Métro. The remaining co-owners are Massachusetts Municipal Wholesale Electric Company (4.7990%) and Dominion Nuclear Connecticut, Inc. (93.4707%). Dominion Nuclear Connecticut, Inc. is the licensed operator.

According to an application for approval filed by CVPS in connection with the consolidation of CVPS and GMP, GMP will be the surviving corporation resulting from the merger. GMP will continue to be a minority co-owner and licensee of the facility. This application does not affect Massachusetts Municipal Wholesale Electric Company's ownership or Dominion Nuclear Connecticut, Inc.'s ownership and operation of the facility.

No physical changes to the MPS3 facility or operational changes are being proposed in the application.

The proposed amendment would replace references to Central Vermont Public Service Corporation with Green Mountain Power Corporation, to reflect the proposed transfer.

Pursuant to 10 CFR 50.80, no license, or any right thereunder, shall be transferred, directly or indirectly, through transfer of control of the license, unless the Commission shall give its consent in writing. The Commission will approve an application for the direct transfer of a license, if the Commission determines that the proposed acquisition will not affect the qualifications of the licensee to hold the license, and that the transfer is otherwise consistent with applicable provisions of law, regulations, and orders issued by the Commission pursuant thereto.

Before issuance of the proposed conforming license amendment, the Commission will have made findings required by the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations.

As provided in 10 CFR 2.1315, unless otherwise determined by the Commission with regard to a specific application, the Commission has determined that any amendment to the license of a utilization facility, which does no more than conform the license to reflect the transfer action, involves no significant hazards consideration. No contrary determination has been made with respect to this specific license amendment application. In light of the generic determination reflected in 10 CFR 2.1315, no public comments with respect to significant hazards considerations are being solicited, notwithstanding the general comment procedures contained in 10 CFR 50.91.

The filing of requests for hearing and petitions for leave to intervene, and written comments with regard to the license transfer application, are discussed below.

**Hearing Request**

Within 20 days from the date of publication of this notice, any person(s) whose interest may be affected by the Commission's action on the application may request a hearing and

intervention via electronic submission through the NRC E-filing system. Requests for a hearing and petitions for leave to intervene should be filed in accordance with the Commission's rules of practice set forth in Subpart C , "Rules of General Applicability: Hearing Requests, Petitions to Intervene, Availability of Documents, Selection of Specific Hearing Procedures, Presiding Officer Powers, and General Hearing Management for NRC Adjudicatory Hearings," of 10 CFR Part 2. In particular, such requests and petitions must comply with the requirements set forth in 10 CFR 2.309. Untimely requests and petitions may be denied, as provided in 10 CFR 2.309(c)(1), unless good cause for failure to file on time is established. In addition, an untimely request or petition should address the factors that the Commission will also consider, in reviewing untimely requests or petitions, set forth in 10 CFR 2.309(c)(1)(i)-(viii). NRC regulations are accessible electronically from the NRC Library on the NRC Web site at http://www.nrc.gov/reading-rm/doc-collections/cfr/.

All documents filed in NRC adjudicatory proceedings, including a request for hearing, a petition for leave to intervene, any motion or other document filed in the proceeding prior to the submission of a request for hearing or petition to intervene, and documents filed by interested governmental entities participating under 10 CFR 2.315(c), must be filed in accordance with the NRC E-Filing rule (72 FR 49139, August 28, 2007). The E-Filing process requires participants to submit and serve all adjudicatory documents over the internet, or in some cases to mail copies on electronic storage media. Participants may not submit paper copies of their filings unless they seek an exemption in accordance with the procedures described below.

To comply with the procedural requirements of E-Filing, at least ten (10) days prior to the filing deadline, the participant should contact the Office of the Secretary by e-mail at hearing.docket@nrc.gov, or by telephone at (301) 415-1677, to request (1) a digital ID certificate, which allows the participant (or its counsel or representative) to digitally sign documents and access the E-Submittal server for any proceeding in which it is participating; and

(2) advise the Secretary that the participant will be submitting a request or petition for hearing (even in instances in which the participant, or its counsel or representative, already holds an NRC-issued digital ID certificate). Based upon this information, the Secretary will establish an electronic docket for the hearing in this proceeding if the Secretary has not already established an electronic docket.

Information about applying for a digital ID certificate is available on NRC's public Web site at http://www.nrc.gov/site-help/e-submittals/apply-certificates.html. System requirements for accessing the E-Submittal server are detailed in NRC's "Guidance for Electronic Submission," which is available on the agency's public Web site at http://www.nrc.gov/site-help/e-submittals.html. Participants may attempt to use other software not listed on the Web site, but should note that the NRC's E-Filing system does not support unlisted software, and the NRC Meta System Help Desk will not be able to offer assistance in using unlisted software.

If a participant is electronically submitting a document to the NRC in accordance with the E-Filing rule, the participant must file the document using the NRC's online, Web-based submission form. In order to serve documents through EIE, users will be required to install a Web browser plug-in from the NRC Web site. Further information on the Web-based submission form, including the installation of the Web browser plug-in, is available on the NRC's public Web site at http://www.nrc.gov/site-help/e-submittals.html.

Once a participant has obtained a digital ID certificate and a docket has been created, the participant can then submit a request for hearing or petition for leave to intervene. Submissions should be in Portable Document Format (PDF) in accordance with NRC guidance available on the NRC public Web site at http://www.nrc.gov/site-help/e-submittals.html. A filing is considered complete at the time the documents are submitted through the NRC's E-Filing system. To be timely, an electronic filing must be submitted to the E-Filing system no later than 11:59 p.m. Eastern Time on the due date. Upon receipt of a transmission, the E-Filing system

time-stamps the document and sends the submitter an e-mail notice confirming receipt of the document. The E-Filing system also distributes an e-mail notice that provides access to the document to the NRC Office of the General Counsel and any others who have advised the Office of the Secretary that they wish to participate in the proceeding, so that the filer need not serve the documents on those participants separately. Therefore, applicants and other participants (or their counsel or representative) must apply for and receive a digital ID certificate before a hearing request/petition to intervene is filed so that they can obtain access to the document via the E-Filing system.

A person filing electronically using the agency's adjudicatory E-Filing system may seek assistance by contacting the NRC Meta System Help Desk through the "Contact Us" link located on the NRC Web site at http://www.nrc.gov/site-help/e-submittals.html, by e-mail at MSHD.Resource@nrc.gov, or by a toll-free call at (866) 672-7640. The NRC Meta System Help Desk is available between 8 a.m. and 8 p.m., Eastern Time, Monday through Friday, excluding government holidays.

Participants who believe that they have a good cause for not submitting documents electronically must file an exemption request, in accordance with 10 CFR 2.302(g), with their initial paper filing requesting authorization to continue to submit documents in paper format. Such filings must be submitted by: (1) first class mail addressed to the Office of the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, Attention: Rulemaking and Adjudications Staff; or (2) courier, express mail, or expedited delivery service to the Office of the Secretary, Sixteenth Floor, One White Flint North, 11555 Rockville Pike, Rockville, Maryland, 20852, Attention: Rulemaking and Adjudications Staff. Participants filing a document in this manner are responsible for serving the document on all other participants. Filing is considered complete by first-class mail as of the time of deposit in the mail, or by courier, express mail, or expedited delivery service upon depositing the document with the

provider of the service. A presiding officer, having granted an exemption request from using E-Filing, may require a participant or party to use E-Filing if the presiding officer subsequently determines that the reason for granting the exemption from use of E-Filing no longer exists.

Documents submitted in adjudicatory proceedings will appear in NRC's electronic hearing docket which is available to the public at http://ehd1.nrc.gov/EHD/, unless excluded pursuant to an order of the Commission, or the presiding officer. Participants are requested not to include personal privacy information, such as social security numbers, home addresses, or home phone numbers in their filings, unless an NRC regulation or other law requires submission of such information. With respect to copyrighted works, except for limited excerpts that serve the purpose of the adjudicatory filings and would constitute a Fair Use application, participants are requested not to include copyrighted materials in their submission.

Petitions for leave to intervene must be filed no later than 20 days from the date of publication of this notice. Non-timely filings will not be entertained absent a determination by the presiding officer that the petition or request should be granted or the contentions should be admitted, based on a balancing of the factors specified in 10 CFR 2.309(c)(1)(i)–(viii).

The Commission will issue a notice or order granting or denying a hearing request or intervention petition, designating the issues for any hearing that will be held and designating the Presiding Officer. A notice granting a hearing will be published in the *Federal Register* and served on the parties to the hearing.

**Comments**

Within 30 days from the date of publication of this notice, persons may submit written comments regarding the license transfer application, as provided for in 10 CFR 2.1305. The Commission will consider and, if appropriate, respond to these comments, but such comments will not otherwise constitute part of the decisional record. Comments should be submitted to the Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, Attention:

Rulemakings and Adjudications Staff, and should cite the publication date and page number of this *Federal Register* notice.

For further details with respect to this license transfer application, see the application dated September 9, 2011, as supplemented by letters dated November 4, 2011, April 6, 2012, May 4, 2016, and June 26, 2012, available for public inspection at the Commission's Public Document Room (PDR), located at One White Flint North, Public File Area O1 F21, 11555 Rockville Pike (first floor), Rockville, Maryland. Publicly available documents created or received at the NRC are accessible electronically through ADAMS in the NRC Library at http://www.nrc.gov/reading-rm/adams.html. Persons who do not have access to ADAMS or who encounter problems in accessing the documents located in ADAMS should contact the NRC PDR Reference staff by telephone at 1-800-397-4209, or 301-415-4737 or by e-mail to pdr.resource@nrc.gov.

Dated at Rockville, Maryland this 9th day of July 2012.

FOR THE NUCLEAR REGULATORY COMMISSION

James Kim

James Kim, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

July 9, 2012

Mr. Dale A. Rocheleau
Senior Vice President, General Counsel
& Corporate Secretary
Central Vermont Public Service Corporation
77 Grove St.
Rutland VT, 05701

SUBJECT: MILLSTONE POWER STATION, UNIT 3 - NOTICE OF CONSIDERATION OF APPROVAL OF TRANSFER OF FACILITY OPERATING LICENSE CONFORMING AMENDMENT AND OPPORTUNITY FOR A HEARING (TAC NO. ME8968)

Dear Mr. Rocheleau:

Enclosed is a copy of a "Notice of Consideration of Approval of Transfer of Facility Operating License, Conforming Amendment, and Opportunity for a Hearing," related to the application dated September 9, 2011, as supplemented by letters dated November 4, 2011, April 6, 2012, May 4, 2012, and June 26, 2012,[1] filed by Central Vermont Public Service Corporation (CVPS). The application, pursuant to 10 CFR 50.80, seeks U.S. Nuclear Regulatory Commission (NRC) approval of the proposed transfer of control of Central Vermont Public Service Corporation (CVPS)' interest in the license for the Millstone Power Station, Unit 3 (MPS3) resulting from a subsequent restructuring in which CVPS will be consolidated with Gaz Métro Limited Partnership (Gaz Métro)'s existing U.S. subsidiary Green Mountain Power Corporation (GMP). The NRC is also considering amending the license for administrative purposes to reflect the proposed transfer.

This notice is being forwarded to the Office of the Federal Register for publication.

Sincerely,
***/ra/***
James Kim, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-423

Enclosure:
Notice

cc w/encl: see next page
DISTRIBUTION:

PUBLIC
RidsAcrsAcnw_MailCTR Resource
RidsNrrDorlLpl-1 Resource
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RidsNrrDorlDpr Resource
RidsNrrLAKGoldstein Resource
RidsOgcRp Resource
RidsNrrDirsItsb

**ADAMS Accession Numbers: PKG/ ML12181A014 LTR/ML12181A018 FRN/ML12181A026**

| OFFICE | DORL/LPL1-1/PM | DORL/LPL1-1/LA | DIRS/IFIB/BC | OGC | DORL/LPL1-1/BC | DORL/LPL1-1/PM |
|---|---|---|---|---|---|---|
| NAME | JKim | KGoldstein | CRegan | SUttal | GWilson (DPickett for) | JKim |
| DATE | 07/02/12 | 07/02/12 | 07/02/12 | 07/03/12 | 07/05/12 | 07/09/12 |

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[1] Agencywide Documents Access and Management System Accession Nos. ML11256A051, ML11311A148, ML12100A017, ML12128A433, and ML12180A123 respectively.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

July 6, 2012

Docket No. 05000245 License No. DPR-21

David A. Heacock
President and Chief Nuclear Officer
Dominion Resources
5000 Dominion Blvd
Glen Allen, VA 23060-6711

SUBJECT: DOMINION NUCLEAR CONNECTICUT, INC., MILLSTONE POWER STATION UNIT 1 - NRC INSPECTION REPORT NO. 05000245/2012008

Dear Mr. Heacock:

On June 25 - 27, 2012, the U.S. Nuclear Regulatory Commission (NRC) conducted an inspection at the Millstone Power Station Unit 1 (MS-1). The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission' s rules and regulation, and the conditions of your license. The inspection consisted of observations by the inspector, interviews with personnel, and a review of procedures and records. The results of the inspection were discussed with William Bartron, Licensing Supervisor, and other members of your staff on June 27, 2012 at the conclusion of the inspection. The enclosed report presents the results of this inspection. No findings of safety significance were identified.

Current NRC regulations and guidance are included on the NRC's website at www.nrc.gov; select **Nuclear Materials; Med, Ind, & Academic Uses;** then **Regulations, Guidance and Communications.** The current Enforcement Policy is included on the NRC's website at www.nrc.gov; select **About NRC, Organizations & Functions; Office of Enforcement; Enforcement documents;** then **Enforcement Policy (Under 'Related Information').** You may also obtain these documents by contacting the Government Printing Office (GPO) toll-free at 1-866-512-1800. The GPO is open from 8:00 a.m. to 5:30 p.m. EST, Monday through Friday (except Federal holidays).

Please contact Laurie Kauffman (610-337-5323) if you have any questions regarding this matter.

Sincerely,

Marc S. Ferdas, Chief
Decommissioning Branch
Division of Nuclear Materials Safety

Enclosure: Inspection Report No. 05000245/2012008

cc: Distribution via ListServ
State of Connecticut

July 6, 2012

Docket No. 05000245 License No. DPR-21

David A. Heacock
President and Chief Nuclear Officer
Dominion Resources
5000 Dominion Blvd
Glen Allen, VA 23060-6711

SUBJECT: DOMINION NUCLEAR CONNECTICUT, INC., MILLSTONE POWER STATION UNIT 1 - NRC INSPECTION REPORT NO. 05000245/2012008

Dear Mr. Heacock:

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Current NRC regulations and guidance are included on the NRC's website at www.nrc.gov; select **Nuclear Materials; Med, Ind, & Academic Uses;** then **Regulations, Guidance and Communications.** The current Enforcement Policy is included on the NRC's website at www.nrc.gov; select **About NRC, Organizations & Functions; Office of Enforcement; Enforcement documents;** then **Enforcement Policy (Under 'Related Information').** You may also obtain these documents by contacting the Government Printing Office (GPO) toll-free at 1-866-512-1800. The GPO is open from 8:00 a.m. to 5:30 p.m. EST, Monday through Friday (except Federal holidays).

Please contact Laurie Kauffman (610-337-5323) if you have any questions regarding this matter.

Sincerely,
***/RA/***
Marc S. Ferdas, Chief
Decommissioning Branch
Division of Nuclear Materials Safety

Enclosure: Inspection Report No. 05000245/2012008
cc: Distribution via ListServ
State of Connecticut

Distribution w/encl: (via email)

| | | |
|---|---|---|
| W. Dean, RA | E. Keighley, DRP | L. Kauffman, DNMS |
| D. Lew, DRA | J. DeBoer, DRP | B. Watson, FSME |
| D. Roberts, DRP | J. Ambrosini, DRP, SRI | S. Giebel, FSME |
| J. Clifford, DRP | B. Haagensen, DRP, RI | RidsNrrPMMillstone Resource |
| C. Miller, DRS | J. Krafty, DRP, RI | RidsNrrDorlLpl1-1 Resource |
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DOCUMENT NAME: G:\WordDocs\Current\Insp Letter\LDPR-21.2012008.doc **SUNSI Review Complete:** LKauffman
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| NAME | LKauffman/lak* | | MFerdas/msf | | | | | |
| DATE | 07/03/12 | | 07/06/12 | | | | | |

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# U.S. NUCLEAR REGULATORY COMMISSION
# REGION I

## INSPECTION REPORT

| | |
|---|---|
| Inspection No. | 05000245/2012008 |
| Docket No. | 05000245 |
| License No. | DPR-21 |
| Licensee: | Dominion Nuclear Connecticut, Inc. (Dominion) |
| Address: | Rope Ferry Road, Waterford, CT 06385 |
| Location Inspected: | Millstone Power Station, Unit 1 (MS-1) |
| Inspection Dates: | June 25-27, 2012 |
| Inspector: | Laurie A. Kauffman<br>Health Physicist<br>Decommissioning Branch<br>Division of Nuclear Materials Safety |
| Approved By: | Marc S. Ferdas, Chief<br>Decommissioning Branch<br>Division of Nuclear Materials Safety |

## EXECUTIVE SUMMARY

Dominion Nuclear Connecticut, Inc.
Millstone Power Station Unit 1
NRC Inspection Report No. 05000245/2012008

A routine announced safety inspection was conducted between June 25 and 27, 2012, by a Region I inspector at MS-1. The inspection included a review of operations and management oversight, maintenance, corrective action program implementation, and plant support activities while in safe storage (SAFSTOR) status. The inspection consisted of observations by the inspector, interviews with Dominion personnel, and a review of procedures and records. The NRC's program for overseeing the safe operation of a shut-down nuclear power reactor is described in Inspection Manual Chapter (IMC) 2561, "Decommissioning Power Reactor Inspection Program."

There are currently no ongoing decommissioning activities being conducted at MS-1. Based on the results of this inspection, no findings of safety significance were identified.

## REPORT DETAILS

### 1.0 Background

MS-1 is located in the town of Waterford, Connecticut. MS-1 was a single cycle, boiling water reactor with a thermal output of 2011 megawatts and a net electrical output of 652.1 megawatts. The plant went into commercial operation on December 28, 1970 and permanently ceased operations on July 17, 1998. Subsequently, the fuel was permanently removed from the reactor vessel and is currently stored in the spent fuel pool. MS-1 is in SAFSTOR and Dominion plans to actively decommission MS-1 in parallel with the decommissioning of the operational units, after they have been permanently shutdown.

The NRC's program for overseeing the safe operation of a shut-down nuclear power reactor is described in IMC 2561. The inspection consisted of observations by the inspector, interviews with Dominion personnel, and a review of procedures and records.

### 2.0 Safe Storage (SAFSTOR) Performance and Status Review

a. Inspection Scope (Inspection Procedures (IPs) 36801, 37801, 40801, 62801, 71801, 83750, 84750, 86750)

A routine announced safety inspection was conducted between June 25 and 27, 2012 at MS-1. The inspector reviewed the SAFSTOR program as outlined in the Defueled Safety Analysis Report (DSAR), Technical Specifications (TS) and Technical Requirements Manual (TRM) to assess the adequacy of management oversight of SAFSTOR responsibilities for MS-1. Specifically, the inspector reviewed the decommissioning management and staff organization and Dominion's implementation of SAFSTOR activities related to safe storage of radioactive material. The inspector discussed any design changes or modifications since the previous inspection; and assessed the material condition of MS-1 during plant tours of the reactor building, the fuel handling floor and the radioactive waste building.

The inspector observed the quarterly survey of the standby shutdown heat exchanger room and reviewed maintenance and surveillance tests for the spent fuel pool (SFP) cooling pumps and motors; the decay heat removal (DHR) pumps, fans, and motors; the ventilation fans and motors; and the emergency diesel generator (EDG) to verify that work was being performed within the established frequencies and that the equipment was being properly maintained.

The inspector reviewed activities and documentation associated with the following SAFSTOR programs: occupational exposure, radioactive effluent control, and site radiological environmental monitoring program (REMP). The inspector reviewed radioactive gaseous and liquid effluent release permits, the annual REMP report, and the annual effluent report, which included a summary of the radioactive waste management and transportation programs. The inspector also reviewed radioactive waste and transportation documents related to dry active waste generated from MS-1.

The inspector reviewed corrective action program (CAP) condition reports (CRs) associated with MS-1 to determine if issues were being properly identified and evaluated, and if corrective actions were appropriately prioritized in the CAP.

b. Observations and Findings

The inspector noted that there were no personnel changes within the Dominion organization related to the SAFSTOR activities and confirmed that the staff effectively implemented the SAFSTOR activities. The inspector confirmed that no design changes, or plant modifications were made since the previous inspection. The inspector verified that the maintenance and surveillance program for systems and components had been conducted in accordance with the TS and TRM requirements and established procedures. The inspector also confirmed that no dismantlement or decommissioning activities were performed since the previous inspection. The annual radiological effluent and radiological environmental monitoring reports demonstrated that all calculated doses were below regulatory dose criteria of 10 CFR 50, Appendix I.

The inspector noted that no significant water intrusion was evident and the material condition of components had remained unchanged in the reactor building, the fuel handling floor and the radioactive waste building since the previous inspection. The inspector also noted that the maintenance and surveillance test results for the SFP cooling pumps and motors; the DHR pumps, fans, and motors; the ventilation fans and motors; and the EDG met the acceptance criteria defined in the procedures and the systems and components were operable and available for service.

The inspector determined that issues were entered into the CAP, and prioritized and evaluated commensurate with their safety significance. Corrective actions were implemented to address identified issues and were being tracked to closure using the CAP.

c. Conclusions

There are currently no ongoing decommissioning activities being conducted at MS-1. No findings of safety significance were identified.

## 3.0 Exit Meeting Summary

On June 27, 2012, the inspector presented the inspection results to Mr. William Bartron, Licensing Supervisor, and other members of the Dominion management and staff. The inspector confirmed that proprietary information was not removed from the site.

## PARTIAL LIST OF PERSONS CONTACTED

Licensee

| | |
|---|---|
| W. Bartron | Licensing Supervisor |
| J. Drzewianowski | Radiation Protection Technician |
| A. Elms | Organizational Effectiveness Manager |
| C. Gannon | Health Physicist, Radiation Protection |
| J. Lane | Radiation Protection and Chemistry Manager |
| E. Palmieri | Nuclear Maintenance Supervisor MS-1 |
| L. Salyards | Licensing Engineer |
| G. Sturgeon | Operations Nuclear Specialist MS-1 |
| P. Tulba | Radioactive Material Control Supervisor |
| S. Turowski | HP Technical Services Supervisor |

## ITEMS OPEN, CLOSED, AND DISCUSSED

None

## LIST OF DOCUMENTS REVIEWED

MS-1 Radiation Surveys conducted between July 2011 and June 2012
MS-1 Radiation Exposure (ALARA) Reports for 2011, and most current for 2012
MS-1 Surveillance Form for Operator Logs and Inspections (Unit 1 rounds)
Radioactive Waste Shipping Papers (No. 11-150) dry active waste, dated February 2011
Micro ALARA Plan RP-AA-300, SFP System Instrumentation and Calibration
RP-AA-220, Rev 1 "Radiological Survey Scheduling," effective May 20, 2012
SP 852, Rev 4, "Spent Fuel Pool Chemistry Control," effective April 5, 2011
SP-608AA, Rev 000, "Backup Diesel Generator Loaded Run," effective March 28, 2012
ONP540 F, Rev. 002-03, "Loss of Normal Power," effective December 7, 2011
OP312 I, Rev. 003, "Waste Water Evaporator System," effective February 2, 2012
OP312 K, Rev. 000-01, "Waste Water Processing System," effective February 27, 2012
OP328 A, Rev. 015-04, "Refueling Platform," effective January 9, 2012
OP328 C, Rev. 024-02, "Main Hoist Operations," effective January 9, 2012
OP360, Rev 001-03, "Programmable Logic Controller," effective January 9, 2012
MS-1 CRs between June 2011 and June 2012
CR436420; CR478363; CR401895; CR434744; CR469912; CR465958; CR465414; CR466007

## LIST OF ACRONYMS USED

| | |
|---|---|
| CAP | Corrective Action Program |
| CFR | Code of Federal Regulations |
| CR | Condition Report |
| DHR | Decay Heat Removal |
| Dominion | Dominion Nuclear Connecticut, Inc. |
| DSAR | Defueled Safety Analysis Report |
| EDG | Emergency Diesel Generator |
| IMC | Inspection Manual Chapter |
| IP | Inspection Procedure |
| MS-1 | Millstone Power Station Unit 1 |
| REMP | Radiological Environmental Monitoring Program |
| SAFSTOR | Safe Storage |
| SFP | Spent Fuel Pool |
| TRM | Technical Requirements Manual |
| TS | Technical Specification |

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 14, 2012

Mr. Dale A. Rocheleau
Senior Vice President, General Counsel
& Corporate Secretary
Central Vermont Public Service Corporation
77 Grove St.
Rutland, VT 05701

SUBJECT: MILLSTONE POWER STATION, UNIT NO. 3 – PARTIAL ACCEPTANCE OF REQUESTED LICENSING ACTION RE: APPLICATION FOR CONSENT TO PROPOSED LICENSE TRANSFERS; REQUEST FOR THRESHOLD DETERMINATION (TAC NO. ME7127)

Dear Mr. Rocheleau:

By letter dated September 9, 2011,[1] Central Vermont Public Service Corporation (CVPS) submitted a license transfer request for Millstone Power Station, Unit No. 3 (MPS3) and a threshold determination request for Main Yankee, Connecticut Yankee, and Yankee Atomic (collectively, the Yankee Companies). The proposed license transfer and threshold determination would result in the following actions:

1. Issuance of an order consenting to the indirect license transfer related to the acquisition of CVPS by Gaz Métro Limited Partnership (Gaz Métro). CVPS owns 1.7303% of MPS3. Dominion Nuclear Connecticut, Inc. (DNC) is the majority owner and the operator. DNC is authorized to act as the agent and representative for CVPS and has exclusive responsibility and control over the physical operation and maintenance of MPS3. Massachusetts Municipal Wholesale Electric Company is also a minority owner of MPS3;

2. Issuance of an order consenting to the direct license transfer related to the consolidation of CVPS with Gaz Métro's existing U.S. subsidiary Green Mountain Power Corporation (the name of the consolidated company has not been determined);

3. Issuance of a conforming license amendment to reflect the new name of the consolidated company; and

4. Issuance of a threshold determination that no license transfer approval is required with respect to CVPS's shareholder interest in the Yankee Companies or if it is determined that NRC approval is needed, then an Order consenting to any license transfers associated with the acquisition of CVPS and the consolidated company are requested. CVPS owns, through equity investment, 2% of the outstanding common stock of Main Yankee Atomic Power Company, 2% outstanding stock of Connecticut Yankee Atomic Power Company, and 3.5% of the outstanding common stock of Yankee Atomic Electric Company.

[1] Agencywide Documents Access and Management System (ADAMS) Accession No. ML11256A051

At this time, CVPS and Gaz Métro have entered into an Agreement and Plan of Merger. However, a consolidation of CVPS and Green Mountain Power is scheduled to take place, but an Agreement and Plan of Merger has not been entered with regard to this consolidation. As such, the name of the consolidated company has not been determined and a conforming license amendment request has not been submitted. In order for the U.S. Nuclear Regulatory Commission (NRC) to complete its review of the direct license transfer related to the consolidation of CVPS with Gaz Métro's existing U.S. subsidiary Green Mountain Power Corporation, an Agreement and Plan of Merger and a license amendment request is needed.

On October 25, 2011, the NRC staff held a teleconference with CVPS representatives to discuss the need for additional information. By letter dated November 4, 2011,[2] CVPS provided a draft Agreement and Plan of Merger associated with the proposed combination of CVPS and Green Mountain Power.

The purpose of this letter is to provide the results of the NRC staff's acceptance review of these requests. The acceptance review was performed to determine if there is sufficient technical information in scope and depth to allow the NRC staff to complete its detailed technical review. The acceptance review is also intended to identify whether the application has any readily apparent information insufficiencies in its characterization of the regulatory requirements or the licensing basis of the plant.

Pursuant to Section 50.80 of Title 10 of the *Code of Federal Regulations* (10 CFR 50), no license for a production or utilization facility, or any rights thereunder, shall be transferred, assigned, or in any manner disposed of, either voluntarily or involuntarily, directly, or indirectly, through transfer of control of the license to any person, unless the Commission gives its consent in writing.

The NRC staff has reviewed your application and concluded that it does provide technical information in sufficient detail to enable the NRC staff to complete its detailed technical review and make an independent assessment regarding the acceptability, in terms of regulatory requirements and the protection of public health and safety and the environment, of the following actions:

1. Issuance of an order consenting to the indirect license transfer related to the acquisition of CVPS by Gaz Métro.

2. Issuance of a threshold determination that no license transfer approval is required with respect to CVPS's shareholder interest in the Yankee Companies or if it is determined that NRC approval is needed, than an Order consenting to the indirect license transfers associated with the acquisition of CVPS.

However, with regard to the consolidation of CVPS and Green Mountain Power the NRC staff has reviewed the November 4, 2011, supplement and concluded that it did not provide technical information in sufficient detail to enable the NRC staff to complete its detailed review and make an independent assessment regarding the acceptability of the proposed transfer and

[2] ADAMS Accession No. ML11311A148

amendment in terms of regulatory requirements and the protection of public health and safety and the environment. Therefore, the NRC staff finds this part of the request for approval of the proposed action unacceptable for NRC review pursuant to 10 CFR 2.101.

In accordance with the September 9, 2011, letter, the NRC staff is separating the indirect license transfer and acquisition request from the direct license transfer and merger request. At this time, the NRC staff will only complete its detailed technical review and make an independent assessment regarding the acceptability of:

1. Issuance of an order consenting to the indirect license transfer related to the acquisition of CVPS by Gaz Métro.

2. Issuance of a threshold determination that no license transfer approval is required with respect to CVPS's shareholder interest in the Yankee Companies or if it is determined that NRC approval is needed, than an Order consenting to the indirect license transfers associated with the acquisition of CVPS.

This review does not preclude CVPS from requesting review of the merger and direct license transfer at a later date.

Given the lesser scope and depth of the acceptance review as compared to the detailed technical review, there may be instances in which issues that impact the NRC staff's ability to complete the detailed technical review are identified despite completion of an adequate acceptance review. You will be advised of any further information needed to support the NRC staff's detailed technical review by separate correspondence.

If you have any questions, please contact me at (301) 415-1603.

Sincerely,

Carleen J. Sanders, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-423

cc: see next page

Letter to Dale A. Rocheleau from Carleen J. Sanders dated

SUBJECT: MILLSTONE POWER STATION, UNIT NO. 3 – PARTIAL ACCEPTANCE OF REQUESTED LICENSING ACTION RE: APPLICATION FOR CONSENT TO PROPOSED LICENSE TRANSFERS; REQUEST FOR THRESHOLD DETERMINATION (TAC NO. ME7127)

cc:

Daniel F. Stenger
Hogan Lovells US LLP
555 Thirteenth Street, NW
Washington, DC 20004

Thomas L. Cubbage, III
Covington & Burling LLP
1201 Pennsylvania Avenue, NW
Washington, DC 20004

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amendment in terms of regulatory requirements and the protection of public health and safety and the environment. Therefore, the NRC staff finds this part of the request for approval of the proposed action unacceptable for NRC review pursuant to 10 CFR 2.101.

In accordance with the September 9, 2011, letter, the NRC staff is separating the indirect license transfer and acquisition request from the direct license transfer and merger request. At this time, the NRC staff will only complete its detailed technical review and make an independent assessment regarding the acceptability of:

1. Issuance of an order consenting to the indirect license transfer related to the acquisition CVPS by Gaz Métro.

2. Issuance of a threshold determination that no license transfer approval is required with respect to CVPS's shareholder interest in the Yankee Companies or if it is determined that NRC approval is needed, than an Order consenting to the indirect license transfers associated with the acquisition of CVPS.

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Given the lesser scope and depth of the acceptance review as compared to the detailed technical review, there may be instances in which issues that impact the NRC staff's ability to complete the detailed technical review are identified despite completion of an adequate acceptance review. You will be advised of any further information needed to support the NRC staff's detailed technical review by separate correspondence.

If you have any questions, please contact me at (301) 415-1603.

Sincerely,
***/ra/***
Carleen J. Sanders, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-423

cc: see next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 21, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Nuclear Connecticut, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060

SUBJECT: BRANCH CHIEF AND PROJECT MANAGER REASSIGNMENT FOR MILLSTONE POWER STATION, UNIT NOS. 2 AND 3

Dear Mr. Heacock:

This letter is to inform you that effective April 9, 2012, Mr. George A. Wilson will be assigned as the U.S. Nuclear Regulatory Commission's Branch Chief for Milllstone Power Station, Units 2 and 3. Additionally, effective the same date, Mr. James S. Kim will be assigned as the Project Manager. Both Mr. Wilson and Mr. Kim are located in Plant Licensing Branch I-1. This branch in the Office of Nuclear Reactor Regulation, Division of Operating Reactor Licensing, will have licensing oversight responsibility for Millstone Power Station, Unit Nos. 2 and 3.

Mr. Wilson may be reached at 301-415-1711 or via e-mail at george.wilson@nrc.gov. Mr. Kim may be reached at 301-415-4125 or via e-mail at james.kim@nrc.gov.

Sincerely,

Louise Lund

Louise Lund, Deputy Director
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-336 and 50-423

cc: Distribution via Listserv

March 21, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Nuclear Connecticut, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060

SUBJECT: BRANCH CHIEF AND PROJECT MANAGER REASSIGNMENT FOR MILLSTONE POWER STATION, UNIT NOS. 2 AND 3

Dear Mr. Heacock:

This letter is to inform you that effective April 9, 2012, Mr. George A. Wilson will be assigned as the U.S. Nuclear Regulatory Commission's Branch Chief for Milllstone Power Station, Units 2 and 3. Additionally, effective the same date, Mr. James S. Kim will be assigned as the Project Manager. Both Mr. Wilson and Mr. Kim are located in Plant Licensing Branch I-1. This branch in the Office of Nuclear Reactor Regulation, Division of Operating Reactor Licensing, will have licensing oversight responsibility for Millstone Power Station, Unit Nos. 2 and 3.

Mr. Wilson may be reached at 301-415-1711 or via e-mail at george.wilson@nrc.gov. Mr. Kim may be reached at 301-415-4125 or via e-mail at james.kim@nrc.gov.

Sincerely,

***/ra/***

Louise Lund, Deputy Director
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-336 and 50-423

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 30, 2012

Mr. Dale A. Rocheleau
Senior Vice President, General Counsel
& Corporate Secretary
Central Vermont Public Service Corporation
77 Grove St.
Rutland, VT 05701

SUBJECT: MILLSTONE POWER STATION, UNIT NO. 3 – REQUEST FOR ADDITIONAL INFORMATION REGARDING PROPOSED LICENSE TRANSFERS; REQUEST FOR THRESHOLD DETERMINATION (TAC NO. ME7127)

Dear Mr. Rocheleau:

By letter dated September 9, 2011,[1] as supplemented by letter dated November 4, 2011,[2] Central Vermont Public Service Corporation (CVPS or applicant) submitted a request that the U.S. Nuclear Regulatory Commission (NRC) consent to a license transfer of license No. NPF-49 for Millstone Power Station, Unit No. 3 (MPS3) to the extent held by CVPS and for a threshold determination request for Main Yankee, Connecticut Yankee, and Yankee Atomic (collectively, the Yankee Companies). By letter dated February 14, 2012,[3] the NRC partially accepted the applicant's request, citing insufficient technical information to complete a review of some of the requests. As such, the proposed license transfer and threshold determination requests that the NRC take the following actions:

1. Issuance of an Order consenting to the indirect license transfer of control related to the acquisition of CVPS by Gaz Métro Limited Partnership (Gaz Métro). CVPS owns 1.7303% of MPS3. Dominion Nuclear Connecticut, Inc. (DNC) is the majority owner and the operator. DNC is authorized to act as the agent and representative for CVPS and has exclusive responsibility and control over the physical operation and maintenance of MPS3. Massachusetts Municipal Wholesale Electric Company is also a minority owner of MPS3;

2. Issuance of a threshold determination that no license transfer approval is required with respect to CVPS shareholder interest in the Yankee Companies or if it is determined that NRC approval is needed, then an Order consenting to any license transfers associated with the acquisition of CVPS and the consolidated company are requested. CVPS owns through equity investment 2% of the outstanding common stock of Main Yankee Atomic Power Company, 2% outstanding stock of Connecticut Yankee Atomic Power Company, and 3.5% of the outstanding common stock of Yankee Atomic Eclectic Company.

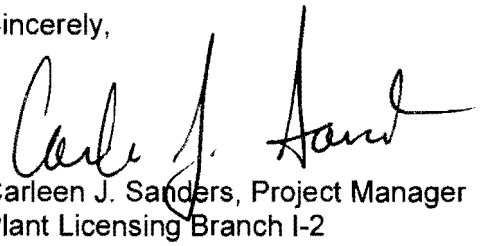
[1] Agencywide Documents Access and Management System (ADAMS) Accession No. ML11256A051
[2] ADAMS Accession No. ML11311A148
[3] ADAMS Accession No. ML120100075

The NRC staff has reviewed the information submitted by the applicant, and based on this review, determined that additional information is required to complete the evaluation.

The draft questions were sent to Mr. Steven Page, of your staff, to ensure that the questions were understandable, the regulatory basis for the questions was clear, and to determine if the information was previously docketed. On March 6, 2012, a clarifying phone call was held between the NRC staff and representatives of CVPS. Based on the information discussed during this phone call, the draft questions were updated. The updated draft questions were sent to Mr. Page, to ensure that the updated questions were understandable, the regulatory basis for the questions was clear, and to determine if the information was previously docketed. On March 26, 2012, Mr. Daniel Stenger, of Hogan Lovells US LLP, who is representing CVPS, agreed that you would provide a response by April 06, 2012. Please note that if you do not respond to this letter by the agreed-upon date or provide an acceptable alternate date in writing, we may reject your application for amendment under the provisions of Title 10 of the *Code* of *Federal Regulations,* Section 2.108.

If you have any questions, please contact me at (301) 415-1603.

Sincerely,



Carleen J. Sanders, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-423

Enclosure:
Request for Additional Information

cc w/encl: See next page

Letter to Dale A. Rocheleau from Carleen J. Sanders dated March 30, 2012.

SUBJECT: MILLSTONE POWER STATION, UNIT NO. 3 – REQUEST FOR ADDITIONAL INFORMATION REGARDING PROPOSED LICENSE TRANSFERS; REQUEST FOR THRESHOLD DETERMINATION (TAC NO. ME7127)

cc:

Daniel F. Stenger
Hogan Lovells US LLP
555 Thirteenth Street, NW
Washington, DC 20004

Thomas L. Cubbage, III
Covington & Burling LLP
1201 Pennsylvania Avenue, NW
Washington, DC 20004

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REQUEST FOR ADDITIONAL INFORMATION

APPLICATION FOR INDIRECT LICENSE TRANSFER AND

REQUEST FOR THRESHOLD DETERMINATION

DOMINION NUCLEAR CONNECTICUT, INC.

MILLSTONE POWER STATION, UNIT NO. 3

DOCKET NO. 50-423

By letter dated September 9, 2011,[4] as supplemented by letter dated November 4, 2011,[5] Central Vermont Public Service Corporation (CVPS or applicant) submitted a request that the U.S. Nuclear Regulatory Commission (NRC) consent to a license transfer of license No. NPF-49 for Millstone Power Station, Unit No. 3 (MPS3) to the extent held by CVPS and for a threshold determination request for Main Yankee, Connecticut Yankee, and Yankee Atomic (collectively, the Yankee Companies). By letter dated February 14, 2012,[6] the NRC partially accepted the applicant's request, citing insufficient technical information to complete a review of some of the requests. As such, the proposed license transfer and threshold determination requests that the NRC take the following actions:

1. Issuance of an Order consenting to the indirect license transfer of control related to the acquisition of CVPS by Gaz Métro Limited Partnership (Gaz Métro). CVPS owns 1.7303% of MPS3. Dominion Nuclear Connecticut, Inc. (DNC) is the majority owner and the operator. DNC is authorized to act as the agent and representative for CVPS and has exclusive responsibility and control over the physical operation and maintenance of MPS3. Massachusetts Municipal Wholesale Electric Company is also a minority owner of MPS3;

2. Issuance of a threshold determination that no license transfer approval is required with respect to CVPS shareholder interest in the Yankee Companies or if it is determined that NRC approval is needed, then an Order consenting to any license transfers associated with the acquisition of CVPS and the consolidated company are requested. CVPS owns through equity investment 2% of the outstanding common stock of Main Yankee Atomic Power Company, 2% outstanding stock of Connecticut Yankee Atomic Power Company, and 3.5% of the outstanding common stock of Yankee Atomic Eclectic Company.

The NRC staff has reviewed the information provided by CVPS and has determined that the following additional information is needed in order to complete the review:

1. The application does not provide information regarding CVPS directors or principal officers after the acquisition of CVPS by Gaz Métro. However, in Attachment 4, "List of

[4] Agencywide Documents Access and Management System (ADAMS) Accession No. ML11256A051
[5] ADAMS Accession No. ML11311A148
[6] ADAMS Accession No. ML120100075

Commitments for Supplemental Information," the applicants do identify a commitment to submit a "List of CVPS directors and principal officers after First Merger." The noted scheduled completion date of this commitment is "As information becomes available." Under information related to the general corporate information regarding CVPS in Attachment 6, "General Corporate Information," the applicants further note that, "The identities of the directors and principal officers following consummation of the merger have not yet been determined. This attachment will be updated in a supplement to the application once those identities have been determined." Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Section 50.33(d)(3)(ii) and 10 CFR 50.38, submit the names, addresses, and citizenship of the directors and principal officers of CVPS after the merger.

2. Section 3.1.4 of Negation Action Plan (NAP) states, among other things, that, "...the Nuclear Committee will have sole discretion to act on behalf of the Board in all matters related to the company's ownership interest in Millstone 3 and the company's shareholder interests in the Yankee Companies. The Nuclear Committee has the exclusive right to exercise the Board's authority over these matters." Section 3.2.1 goes on to state, among other things, "...the full Board of Directors shall have authority to decide all matters not delegated to the Special Nuclear Committee, including the following special reserved matters: ...c) The right to take any action that is ordered by the NRC or any other agency or court of competent jurisdiction." Section 3.2.1 appears to give the full Board authority over NRC licensed activities for MPS3 and the Yankee Companies. Pursuant to 10 CFR 50.38, explain who will have authority to make decisions related to NRC safety and security issues, including those imposed by Order.

3. The NAP does not explicitly state what voting rights, if any, foreign members of the Board of Directors have on measures concerning nuclear safety and security. Pursuant to 10 CFR 50.38, explain what voting rights foreign members of the Board of Directors have on measures concerning nuclear safety and security.

4. Section 4.1 of the NAP states, "[u]pon acceptance of this Plan by the NRC, changes to this Plan may only be made upon the recommendation of CVPS or the Combined Company, and approval of the Special Nuclear Committee. Any proposed change that would result in a decrease in the effectiveness of this Plan will not be implemented without prior notification to and approval, as necessary, of the NRC." However, the NRC considers that all changes to an approved Plan or the related provisions of the underlying bylaws shall be reported to and approved by the NRC prior to implementation. Pursuant to 10 CFR 50.38, explain the discrepancy between the language in Section 4.1 of the NAP and the notification of the NRC when evaluating changes to the NAP and revise the proposed NAP as necessary.

5. Section 5.1 of the NAP states, "Any member of the Committee is empowered to report to the NRC any action by a foreign citizen which the member believes is designed to unduly influence his or her behavior to the detriment of the national interest or otherwise contrary to the NRC's restrictions on FOCD [foreign ownership, control or domination]." Pursuant to 10 CFR 50.38, clarify the Special Nuclear Committee's NRC reporting process.

The NRC staff has reviewed the information submitted by the applicant, and based on this review, determined that additional information is required to complete the evaluation.

The draft questions were sent to Mr. Steven Page, of your staff, to ensure that the questions were understandable, the regulatory basis for the questions was clear, and to determine if the information was previously docketed. On March 6, 2012, a clarifying phone call was held between the NRC staff and representatives of CVPS. Based on the information discussed during this phone call, the draft questions were updated. The updated draft questions were sent to Mr. Page, to ensure that the updated questions were understandable, the regulatory basis for the questions was clear, and to determine if the information was previously docketed. On March 26, 2012, Mr. Daniel Stenger, of Hogan Lovells US LLP, who is representing CVPS, agreed that you would provide a response by April 06, 2012. Please note that if you do not respond to this letter by the agreed-upon date or provide an acceptable alternate date in writing, we may reject your application for amendment under the provisions of Title 10 of the *Code* of *Federal Regulations,* Section 2.108.

If you have any questions, please contact me at (301) 415-1603.

Sincerely,

/RA/

Carleen J. Sanders, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-423

Enclosure:
Request for Additional Information

cc w/encl: See next page

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Letter to Dale A. Rocheleau from Carleen J. Sanders dated March 30, 2012.

SUBJECT: MILLSTONE POWER STATION, UNIT NO. 3 – REQUEST FOR ADDITIONAL INFORMATION REGARDING PROPOSED LICENSE TRANSFERS; REQUEST FOR THRESHOLD DETERMINATION (TAC NO. ME7127)

cc:

Daniel F. Stenger
Hogan Lovells US LLP
555 Thirteenth Street, NW
Washington, DC 20004

Thomas L. Cubbage, III
Covington & Burling LLP
1201 Pennsylvania Avenue, NW
Washington, DC 20004

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MN No. 12-016

U.S. NUCLEAR REGULATORY COMMISSION
REGION I
NOTICE OF PUBLIC MEETING

April 2, 2012

| | |
|---|---|
| Licensee: | Dominion Nuclear Connecticut, Inc. |
| Facilities: | Millstone Power Station |
| Docket Nos: | 50-336 and 50-423 |
| Date/Time: | Thursday, April 19, 2012<br>5:30 p.m. to 7:00 p.m. |
| Location: | Waterford Town Hall<br>15 Rope Ferry Road<br>Waterford, CT 06385 |
| Purpose: | The U. S. Nuclear Regulatory Commission (NRC) will meet with the public to discuss the NRC's assessment of safety performance at Millstone Power Station for 2011, as described in the annual assessment letter dated March 5, 2012. The NRC will respond to questions on specific performance issues at the plant and our role in ensuring safe plant operations. |
| NRC Attendees: | P. Wilson, Deputy Director, Division of Reactor Safety<br>R. Bellamy, Ph.D., Chief, Division of Reactor Projects, Branch 5<br>G. Wilson, Chief, Division of Plant Licensing, Branch 1<br>C. Sanders, Project Manager<br>S. Shaffer, Senior Resident Inspector<br>J. Ambrosini, Incoming Senior Resident Inspector<br>B. Haagensen, Resident Inspector<br>J. Krafty, Resident Inspector |
| Public Participation: | This is a Category 3 Meeting. The NRC staff will hold an open house to discuss Dominion's performance at Millstone Power Station during calendar year 2011. NRC staff will be available, in an informational setting, to answer questions from members of the public and discuss issues or concerns related to Millstone. |
| Meeting Contact: | Ronald R. Bellamy, Ph.D, Chief, Projects Branch 5<br>610-337-5200<br>E-mail: Ronald.Bellamy@nrc.gov |

The NRC's annual assessment letter regarding Millstone Power Station performance during 2011 can be found in the NRC's Agencywide Documents Access and Management System (ADAMS) with Accession Number ML12061A240. ADAMS is accessible from the NRC website at: http://www.nrc.gov/reading-rm/adams.html.

Additional information relative to the NRC's annual assessment process and the safety performance of Millstone Power Station, can be found on the NRC's website at: http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/index.html.

The NRC's Policy Statement, "Enhancing Public Participation in NRC Meetings," effective May 28, 2002, applies to this meeting. The policy statement may be found on the NRC website, http://www.nrc.gov/reading-rm/doc-collections/commission/policy/67fr36920.html, and contains information regarding visitors and security.

The NRC provides reasonable accommodation to individuals with disabilities where appropriate. If you need a reasonable accommodation to participate in this meeting, or need the meeting notice or other information from the meeting in another format (e.g., Braille, large print), please notify the NRC's meeting contact. Determinations on requests for reasonable accommodation will be made on a case-by-case basis. Persons requiring assistance to attend the meeting shall make their requests known to the NRC meeting contact no later than two business days prior to the meeting.

Attendance by other NRC personnel at this meeting should be made known by April 16, 2012, via telephone to the NRC meeting contact.

Meetings are sometimes canceled or rescheduled as a result of unforeseen circumstances. Please confirm the meeting schedule on the NRC website under public meetings.

Approved by: **/RA/**
Ronald R. Bellamy, Ph.D., Chief
Projects Branch 5
Division of Reactor Projects

cc: Distribution via ListServ

Additional information relative to the NRC's annual assessment process and the safety performance of Millstone Power Station, can be found on the NRC's website at: http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/index.html.

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Approved by: **/RA/**
Ronald R. Bellamy Ph.D., Chief
Projects Branch 5
Division of Reactor Projects

Distribution: (via email)

| | |
|---|---|
| Executive Director for Operations, OEDO | (RIDSEDOMAILCENTER) |
| Deputy Executive Director for Reactor Programs, OED | (RIDSEDOMAILCENTER) |
| Director, Office of Nuclear Reactor Regulation, NRR | (RIDSNRROD) |
| Deputy Director, Office of Nuclear Reactor Regulation NRR | (RIDSNRROD) |
| Director, Division of Inspection & Regional Support, NRR/DIRS | (RIDSNRRDIRS) |
| Director, Division of Operating Reactor Licensing, NRR/DORL | (RIDSNRRDORL) |
| Asst. General Counsel Materials Litigation & Enforcement, OGC | (RIDSOGCMAILCENTER) |

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| D. Lew, DRA | B. Haagensen, RI | L. Pinkham, DRP |
| J. Clifford, DRP | J. Krafty, RI | D. Bearde, DRS |
| J. Trapp, DRP | C. Kowalalyshyn, Admin | T. Haverkamp, DNMS |
| C. Miller, DRS | N. Sheehan, PAO | L. Larche, DRM |
| P. Wilson, DRS | D. Screnci, PAO | V. Lewis, RI Receptionist |
| L. Chang, RI OEDO | N. McNamara, SLO | ROPreportsResource@nrc.gov |
| R. Bellamy, DRP | D. Tifft, SLO | PMNS |
| T. Setzer, DRP | G. Matakas, ORA | |
| E. Keighley, PE | C. O'Daniell, ORA | |

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**NUCLEAR ENERGY ADVISORY COUNCIL**
**7:00 PM**
**December 6, 2012**
**LOUISE APPLEBY ROOM**
**WATERFORD TOWN HALL**
**15 ROPE FERRY ROAD**
**WATERFORD, CT 06385**
**REGULAR MEETING**
**MINUTES**

## Members Present

Mr. Bill Sheehan, Chair
Ms. Pearl Rathbun, Vice Chair
Ms. Marge DeBold
Mr. Denny Hicks
Rep. Kevin Ryan
Dr. Edward Wilds representing Commissioner Esty (By telephone)

**1. Call to Order of Meeting**

NEAC Chair Sheehan called the meeting to order at 7:05 PM at Waterford Town Hall, Waterford, CT

**2. Approval of Minutes of July 19, 2012 NEAC meeting**

Approval of Minutes of July 19, 2012 as presented. Motion was made and seconded by Ms. Rathbun/Ms. DeBold to approve minutes; no objections; unanimous vote in favor.

**3. Public Comment**

No public comment

**4. NRC Correspondence Received since past meeting**

Chair Sheehan passed out the list of NRC correspondence received and forwarded to Council members via email. See Attached. No Questions

**5. CY 2012 Annual Report Discussions**

The Council discussed the 2012 Annual Report. Only minor edits made to correct grammar and letter spacing.

**6. CY 2012 Annual Report Approval**

Motion made by Rep. Ryan and seconded by Ms. DeBold to approve the 2012 Annual Report with the minor edits discussed; no objections; unanimous vote in favor.

**7. Approval of Regular Meeting Schedule for CY 2013**

Motion was made by Ms. Rathbun and seconded by Mr. Hicks to accept 2013 meeting schedule as presented; no objections; unanimous vote in favor. Schedule attached.

**8. Programs for CY 2013**

Council discussed potential topics for 2013. See Attached list of potential topics.

**9. Next Meeting Date and Time**

April 18, 2013 at Waterford Town Hall. Time to be determined in coordination with the U.S. Nuclear Regulatory Commission.

**10. Adjournment**

Motion was made by Ms. Rathbun and seconded Rep. Ryan to adjourn; no objections; unanimous vote in favor; meeting adjourned at 7:20 PM.

## NRC Correspondence Received Since Last NEAC Meeting

1. MPS3 – Notice of Consideration of Approval of Transfer of Facility Operating License Conforming Amendment and Opportunity for a Hearing (TAC NO. ME8968) dtd July 9, 2012
2. MPS – NRC Integrated Inspection Report dtd July 23, 2012
3. MPS- NRC Problem Identification and Resolution Inspection Report dtd August 31, 2012
4. MPS 2 and 3 – Mid-Cycle Performance Review and Inspection Plan dtd September 4, 2012
5. MPS- NRC Integrated Inspection Report dtd November 2, 2012
6. MPS- NRC Supplemental Inspection Report and Assessment Follow-up Letter dtd November 2, 2012
7. MPS 2 and 3 – NRC Evaluated Emergency Preparedness Exercise Inspection Report dtd November 16, 2012
8. Status of 60-day Response to Orders Modifying Licenses Regarding Recommendations..of the Near Term Task Force Related to the Fukushima Dai-Chi Nuclear Power Plant Accident dtd November 29, 2012

## 2013 Meeting Schedule

Thursday April 18, 2013 – NRC 2011 Performance Evaluation
Tuesday May 14, 2013- Tour of Connecticut Yankee Independent Spent Fuel Storage Installation
Thursday August 22, 2013 – Tour of Millstone Power Station/Dominion Update
Thursday December 12, 2013 – Annual Report Preparation

Special Meetings would be at the call of the Chairman.

## Possible NEAC Meeting Topics - 2013

Joint NRC/NEAC Meeting
Tour of Millstone Power Station followed by Dominion Update Brief
Update on Dominion Operator Training Requirements
Update on Employee Concerns and Safety Conscious Work Environment
Status of Low Level Radioactive Waste Disposal Compact
Status of Blue Ribbon Commission Report Action Items
Tour of Connecticut Yankee (CY) Independent Spent Fuel Storage Installation (ISFSI)
Annual Report Preparation

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 9, 2012

Mr. Dale A. Rocheleau
Senior Vice President, General Counsel
& Corporate Secretary
Central Vermont Public Service Corporation
77 Grove St.
Rutland, VT 05701

SUBJECT: MILLSTONE POWER STATION, UNIT 3 - NOTICE OF CONSIDERATION OF APPROVAL OF TRANSFER OF FACILITY OPERATING LICENSE CONFORMING AMENDMENT AND OPPORTUNITY FOR A HEARING (TAC NO. ME8968)

Dear Mr. Rocheleau:

Enclosed is a copy of a "Notice of Consideration of Approval of Transfer of Facility Operating License, Conforming Amendment, and Opportunity for a Hearing," related to the application dated September 9, 2011, as supplemented by letters dated November 4, 2011, April 6, 2012, May 4, 2012, and June 26, 2012,[1] filed by Central Vermont Public Service Corporation (CVPS). The application, pursuant to 10 CFR 50.80, seeks U.S. Nuclear Regulatory Commission (NRC) approval of the proposed transfer of control of Central Vermont Public Service Corporation (CVPS)' interest in the license for the Millstone Power Station, Unit 3 (MPS3) resulting from a subsequent restructuring in which CVPS will be consolidated with Gaz Métro Limited Partnership (Gaz Métro)'s existing U.S. subsidiary Green Mountain Power Corporation (GMP). The NRC is also considering amending the license for administrative purposes to reflect the proposed transfer.

This notice is being forwarded to the Office of the Federal Register for publication.

Sincerely,

James Kim

James Kim, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-423

Enclosure:
Notice

cc w/encl: see next page

[1] Agencywide Documents Access and Management System Accession Nos. ML11256A051, ML11311A148, ML12100A017, ML12128A433, and ML12180A123 respectively.

Letter to Dale A. Rocheleau from James Kim dated July 9, 2012

SUBJECT: MILLSTONE POWER STATION, UNIT 3 - NOTICE OF CONSIDERATION OF APPROVAL OF TRANSFER OF FACILITY OPERATING LICENSE CONFORMING AMENDMENT AND OPPORTUNITY FOR A HEARING (TAC NO. ME8968)

cc:

Daniel F. Stenger
Hogan Lovells US LLP
555 Thirteenth Street, NW
Washington, DC 20004

Thomas L. Cubbage, III
Covington & Burling LLP
1201 Pennsylvania Avenue, NW
Washington, DC 20004

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UNITED STATES NUCLEAR REGULATORY COMMISSION

CENTRAL VERMONT PUBLIC SERVICE CORPORATION

MILLSTONE POWER STATION, UNIT NO. 3

DOCKET NO. 50-423

NOTICE OF CONSIDERATION OF

APPROVAL OF TRANSFER OF FACILITY OPERATING LICENSE, CONFORMING

AMENDMENT AND OPPORTUNITY FOR A HEARING

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Notice of request for license transfer and conforming license, opportunity to comment, opportunity to request a hearing.

**DATES:** Comments must be filed by **[INSERT DATE: 30 DAYS FROM DATE OF PUBLICATION OF THIS FEDERAL REGISTER NOTICE]**. A request for a hearing must be filed by **[INSERT DATE: 20 DAYS FROM DATE OF PUBLICATION OF THIS FEDERAL REGISTER NOTICE]**.

**ADDRESSES:** Please include Docket ID **NRC-20XX-XXXX** in the subject line of your comments. Comments submitted in writing or in electronic form will be posted on the NRC Web site and on the Federal rulemaking Web site http://www.regulations.gov. Because your comments will not be edited to remove any identifying or contact information, the NRC cautions you against including any information in your submission that you do not want to be publicly disclosed.

The NRC requests that any party soliciting or aggregating comments received from other persons for submission to the NRC inform those persons that the NRC will not edit their

comments to remove any identifying or contact information, and therefore, they should not include any information in their comments that they do not want publicly disclosed.

You may submit comments by any one of the following methods.

**Federal Rulemaking Web Site:** Go to http://www.regulations.gov and search for documents filed under Docket ID **NRC-20XX-XXXX.** Address questions about NRC dockets to Carol Gallagher 301-492-3668; e-mail Carol.Gallagher@nrc.gov.

**Mail comments to:** Chief, Rules, Announcements, and Directives Branch (RADB), Office of Administration, Mail Stop: TWB-05-B01M, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

**Fax comments to:** RADB at 301-492-3446.

You can access publicly available documents related to this notice using the following methods:

**NRC's Public Document Room (PDR):** The public may examine and have copied, for a fee, publicly available documents at the NRC's PDR, O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

**NRC's Agencywide Documents Access and Management System (ADAMS):** Publicly available documents created or received at the NRC are available online in the NRC Library at http://www.nrc.gov/reading-rm/adams.html. From this page, the public can gain entry into ADAMS, which provides text and image files of the NRC's public documents. If you do not have access to ADAMS or if there are problems in accessing the documents located in ADAMS, contact the NRC's PDR reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to pdr.resource@nrc.gov. The application dated September 9, 2011, as supplemented by letters dated November 4, 2011, April 6, 2012, May 4, 2012 and June 26, 2012 are available electronically under ADAMS Accession Nos. ML11256A051, ML11311A148, ML12100A017, ML12128A433 and ML12180A123, respectively.

**FOR FURTHER INFORMATION CONTACT:** James Kim, Project Manager, Plant Licensing Branch I-1, Division of Operating Reactor Licensing, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555. Telephone: 301-415-4125: fax number: 301-415-2102; e-mail: james.kim@nrc.gov.

**Background**

The U.S. Nuclear Regulatory Commission (the Commission) is considering the issuance of an order under 10 CFR 50.80 approving the transfer of control of Central Vermont Public Service Corporation (CVPS)' interest in the Renewed Facility Operating License (No. NPF-49) for the Millstone Power Station, Unit 3 (MPS3) resulting from a subsequent restructuring in which CVPS will be consolidated with Gaz Métro Limited Partnership (Gaz Métro)'s existing U.S. subsidiary Green Mountain Power Corporation (GMP). The Commission is also considering amending the license for administrative purposes to reflect the proposed transfer. By Order dated June 15, 2012, the Commission approved the indirect transfer of control of CVPS' 1.7303% interest in the license for MPS3 resulting from the acquisition of CVPS by Gaz Métro. The remaining co-owners are Massachusetts Municipal Wholesale Electric Company (4.7990%) and Dominion Nuclear Connecticut, Inc. (93.4707%). Dominion Nuclear Connecticut, Inc. is the licensed operator.

According to an application for approval filed by CVPS in connection with the consolidation of CVPS and GMP, GMP will be the surviving corporation resulting from the merger. GMP will continue to be a minority co-owner and licensee of the facility. This application does not affect Massachusetts Municipal Wholesale Electric Company's ownership or Dominion Nuclear Connecticut, Inc.'s ownership and operation of the facility.

No physical changes to the MPS3 facility or operational changes are being proposed in the application.

The proposed amendment would replace references to Central Vermont Public Service Corporation with Green Mountain Power Corporation, to reflect the proposed transfer.

Pursuant to 10 CFR 50.80, no license, or any right thereunder, shall be transferred, directly or indirectly, through transfer of control of the license, unless the Commission shall give its consent in writing. The Commission will approve an application for the direct transfer of a license, if the Commission determines that the proposed acquisition will not affect the qualifications of the licensee to hold the license, and that the transfer is otherwise consistent with applicable provisions of law, regulations, and orders issued by the Commission pursuant thereto.

Before issuance of the proposed conforming license amendment, the Commission will have made findings required by the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations.

As provided in 10 CFR 2.1315, unless otherwise determined by the Commission with regard to a specific application, the Commission has determined that any amendment to the license of a utilization facility, which does no more than conform the license to reflect the transfer action, involves no significant hazards consideration. No contrary determination has been made with respect to this specific license amendment application. In light of the generic determination reflected in 10 CFR 2.1315, no public comments with respect to significant hazards considerations are being solicited, notwithstanding the general comment procedures contained in 10 CFR 50.91.

The filing of requests for hearing and petitions for leave to intervene, and written comments with regard to the license transfer application, are discussed below.

**Hearing Request**

Within 20 days from the date of publication of this notice, any person(s) whose interest may be affected by the Commission's action on the application may request a hearing and

intervention via electronic submission through the NRC E-filing system. Requests for a hearing and petitions for leave to intervene should be filed in accordance with the Commission's rules of practice set forth in Subpart C , "Rules of General Applicability: Hearing Requests, Petitions to Intervene, Availability of Documents, Selection of Specific Hearing Procedures, Presiding Officer Powers, and General Hearing Management for NRC Adjudicatory Hearings," of 10 CFR Part 2. In particular, such requests and petitions must comply with the requirements set forth in 10 CFR 2.309. Untimely requests and petitions may be denied, as provided in 10 CFR 2.309(c)(1), unless good cause for failure to file on time is established. In addition, an untimely request or petition should address the factors that the Commission will also consider, in reviewing untimely requests or petitions, set forth in 10 CFR 2.309(c)(1)(i)-(viii). NRC regulations are accessible electronically from the NRC Library on the NRC Web site at http://www.nrc.gov/reading-rm/doc-collections/cfr/.

All documents filed in NRC adjudicatory proceedings, including a request for hearing, a petition for leave to intervene, any motion or other document filed in the proceeding prior to the submission of a request for hearing or petition to intervene, and documents filed by interested governmental entities participating under 10 CFR 2.315(c), must be filed in accordance with the NRC E-Filing rule (72 FR 49139, August 28, 2007). The E-Filing process requires participants to submit and serve all adjudicatory documents over the internet, or in some cases to mail copies on electronic storage media. Participants may not submit paper copies of their filings unless they seek an exemption in accordance with the procedures described below.

To comply with the procedural requirements of E-Filing, at least ten (10) days prior to the filing deadline, the participant should contact the Office of the Secretary by e-mail at hearing.docket@nrc.gov, or by telephone at (301) 415-1677, to request (1) a digital ID certificate, which allows the participant (or its counsel or representative) to digitally sign documents and access the E-Submittal server for any proceeding in which it is participating; and

(2) advise the Secretary that the participant will be submitting a request or petition for hearing (even in instances in which the participant, or its counsel or representative, already holds an NRC-issued digital ID certificate). Based upon this information, the Secretary will establish an electronic docket for the hearing in this proceeding if the Secretary has not already established an electronic docket.

Information about applying for a digital ID certificate is available on NRC's public Web site at http://www.nrc.gov/site-help/e-submittals/apply-certificates.html. System requirements for accessing the E-Submittal server are detailed in NRC's "Guidance for Electronic Submission," which is available on the agency's public Web site at http://www.nrc.gov/site-help/e-submittals.html. Participants may attempt to use other software not listed on the Web site, but should note that the NRC's E-Filing system does not support unlisted software, and the NRC Meta System Help Desk will not be able to offer assistance in using unlisted software.

If a participant is electronically submitting a document to the NRC in accordance with the E-Filing rule, the participant must file the document using the NRC's online, Web-based submission form. In order to serve documents through EIE, users will be required to install a Web browser plug-in from the NRC Web site. Further information on the Web-based submission form, including the installation of the Web browser plug-in, is available on the NRC's public Web site at http://www.nrc.gov/site-help/e-submittals.html.

Once a participant has obtained a digital ID certificate and a docket has been created, the participant can then submit a request for hearing or petition for leave to intervene. Submissions should be in Portable Document Format (PDF) in accordance with NRC guidance available on the NRC public Web site at http://www.nrc.gov/site-help/e-submittals.html. A filing is considered complete at the time the documents are submitted through the NRC's E-Filing system. To be timely, an electronic filing must be submitted to the E-Filing system no later than 11:59 p.m. Eastern Time on the due date. Upon receipt of a transmission, the E-Filing system

time-stamps the document and sends the submitter an e-mail notice confirming receipt of the document. The E-Filing system also distributes an e-mail notice that provides access to the document to the NRC Office of the General Counsel and any others who have advised the Office of the Secretary that they wish to participate in the proceeding, so that the filer need not serve the documents on those participants separately. Therefore, applicants and other participants (or their counsel or representative) must apply for and receive a digital ID certificate before a hearing request/petition to intervene is filed so that they can obtain access to the document via the E-Filing system.

A person filing electronically using the agency's adjudicatory E-Filing system may seek assistance by contacting the NRC Meta System Help Desk through the "Contact Us" link located on the NRC Web site at http://www.nrc.gov/site-help/e-submittals.html, by e-mail at MSHD.Resource@nrc.gov, or by a toll-free call at (866) 672-7640. The NRC Meta System Help Desk is available between 8 a.m. and 8 p.m., Eastern Time, Monday through Friday, excluding government holidays.

Participants who believe that they have a good cause for not submitting documents electronically must file an exemption request, in accordance with 10 CFR 2.302(g), with their initial paper filing requesting authorization to continue to submit documents in paper format. Such filings must be submitted by: (1) first class mail addressed to the Office of the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, Attention: Rulemaking and Adjudications Staff; or (2) courier, express mail, or expedited delivery service to the Office of the Secretary, Sixteenth Floor, One White Flint North, 11555 Rockville Pike, Rockville, Maryland, 20852, Attention: Rulemaking and Adjudications Staff. Participants filing a document in this manner are responsible for serving the document on all other participants. Filing is considered complete by first-class mail as of the time of deposit in the mail, or by courier, express mail, or expedited delivery service upon depositing the document with the

provider of the service. A presiding officer, having granted an exemption request from using E-Filing, may require a participant or party to use E-Filing if the presiding officer subsequently determines that the reason for granting the exemption from use of E-Filing no longer exists.

Documents submitted in adjudicatory proceedings will appear in NRC's electronic hearing docket which is available to the public at http://ehd1.nrc.gov/EHD/, unless excluded pursuant to an order of the Commission, or the presiding officer. Participants are requested not to include personal privacy information, such as social security numbers, home addresses, or home phone numbers in their filings, unless an NRC regulation or other law requires submission of such information. With respect to copyrighted works, except for limited excerpts that serve the purpose of the adjudicatory filings and would constitute a Fair Use application, participants are requested not to include copyrighted materials in their submission.

Petitions for leave to intervene must be filed no later than 20 days from the date of publication of this notice. Non-timely filings will not be entertained absent a determination by the presiding officer that the petition or request should be granted or the contentions should be admitted, based on a balancing of the factors specified in 10 CFR 2.309(c)(1)(i)–(viii).

The Commission will issue a notice or order granting or denying a hearing request or intervention petition, designating the issues for any hearing that will be held and designating the Presiding Officer. A notice granting a hearing will be published in the *Federal Register* and served on the parties to the hearing.

**Comments**

Within 30 days from the date of publication of this notice, persons may submit written comments regarding the license transfer application, as provided for in 10 CFR 2.1305. The Commission will consider and, if appropriate, respond to these comments, but such comments will not otherwise constitute part of the decisional record. Comments should be submitted to the Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, Attention:

Rulemakings and Adjudications Staff, and should cite the publication date and page number of this *Federal Register* notice.

For further details with respect to this license transfer application, see the application dated September 9, 2011, as supplemented by letters dated November 4, 2011, April 6, 2012, May 4, 2016, and June 26, 2012, available for public inspection at the Commission's Public Document Room (PDR), located at One White Flint North, Public File Area O1 F21, 11555 Rockville Pike (first floor), Rockville, Maryland. Publicly available documents created or received at the NRC are accessible electronically through ADAMS in the NRC Library at http://www.nrc.gov/reading-rm/adams.html. Persons who do not have access to ADAMS or who encounter problems in accessing the documents located in ADAMS should contact the NRC PDR Reference staff by telephone at 1-800-397-4209, or 301-415-4737 or by e-mail to pdr.resource@nrc.gov.

Dated at Rockville, Maryland this 9th day of July 2012.

FOR THE NUCLEAR REGULATORY COMMISSION

James Kim

James Kim, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

July 9, 2012

Mr. Dale A. Rocheleau
Senior Vice President, General Counsel
& Corporate Secretary
Central Vermont Public Service Corporation
77 Grove St.
Rutland VT, 05701

SUBJECT: MILLSTONE POWER STATION, UNIT 3 - NOTICE OF CONSIDERATION OF APPROVAL OF TRANSFER OF FACILITY OPERATING LICENSE CONFORMING AMENDMENT AND OPPORTUNITY FOR A HEARING (TAC NO. ME8968)

Dear Mr. Rocheleau:

Enclosed is a copy of a "Notice of Consideration of Approval of Transfer of Facility Operating License, Conforming Amendment, and Opportunity for a Hearing," related to the application dated September 9, 2011, as supplemented by letters dated November 4, 2011, April 6, 2012, May 4, 2012, and June 26, 2012,[1] filed by Central Vermont Public Service Corporation (CVPS). The application, pursuant to 10 CFR 50.80, seeks U.S. Nuclear Regulatory Commission (NRC) approval of the proposed transfer of control of Central Vermont Public Service Corporation (CVPS)' interest in the license for the Millstone Power Station, Unit 3 (MPS3) resulting from a subsequent restructuring in which CVPS will be consolidated with Gaz Métro Limited Partnership (Gaz Métro)'s existing U.S. subsidiary Green Mountain Power Corporation (GMP). The NRC is also considering amending the license for administrative purposes to reflect the proposed transfer.

This notice is being forwarded to the Office of the Federal Register for publication.

Sincerely,
***/ra/***
James Kim, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-423

Enclosure:
Notice

cc w/encl: see next page
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**ADAMS Accession Numbers: PKG/ ML12181A014 LTR/ML12181A018 FRN/ML12181A026**

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|---|---|---|---|---|---|---|
| NAME | JKim | KGoldstein | CRegan | SUttal | GWilson (DPickett for) | JKim |
| DATE | 07/02/12 | 07/02/12 | 07/02/12 | 07/03/12 | 07/05/12 | 07/09/12 |

OFFICIAL RECORD COPY

[1] Agencywide Documents Access and Management System Accession Nos. ML11256A051, ML11311A148, ML12100A017, ML12128A433, and ML12180A123 respectively.

**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
**REGION I**
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

July 23, 2012

Mr. David Heacock
President and Chief Nuclear Officer
Dominion Resources
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION – NRC INTEGRATED INSPECTION REPORT 05000336/2012003 AND 05000423/2012003

Dear Mr. Heacock:

On June 30, 2012**,** the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Millstone Power Station, Units 2 and 3. The enclosed inspection report documents the inspection results, which were discussed on July 16, 2012 with Stephen E. Scace, Site Vice President, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents one NRC-identified finding of very low safety significance (Green**).** This finding was determined not to involve violations of NRC requirements. Additionally, a licensee-identified violation, which was determined to be of very low safety significance, is listed in this report. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the Enforcement Policy. If you contest any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Millstone.

In accordance with 10 CFR 2.390 of the NRCs "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the

NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

***/RA/***

Ronald R. Bellamy, PhD, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Docket Nos.: 50-336, 50-423
License Nos.: DRP-65, NPF-49

Enclosure: Inspection Report 05000336/2012003 and 05000423/2012003
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

***/RA/***

Ronald R. Bellamy, PhD, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Docket Nos.: 50-336, 50-423
License Nos.: DRP-65, NPF-49

Enclosure: Inspection Report 05000336/2012003 and 05000423/2012003
w/Attachment: Supplemental Information

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ADAMS ACCESSION NUMBER: **ML12206A027**

| ☑ SUNSI Review | | ☑ Non-Sensitive<br>☐ Sensitive | | ☑ Publicly Available<br>☐ Non-Publicly Available | |
|---|---|---|---|---|---|
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| NAME | JAmbrosini/via email | RBellamy | | | |
| DATE | 07/23 /12 | 07/23/12 | | | |

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

| | |
|---|---|
| Docket Nos.: | 50-336, 50-423 |
| License Nos.: | DPR-65, NPF-49 |
| Report No.: | 05000336/2012003 and 05000423/2012003 |
| Licensee: | Dominion Nuclear Connecticut, Inc. |
| Facility: | Millstone Power Station, Units 2 and 3 |
| Location: | P.O. Box 128<br>Waterford, CT 06385 |
| Dates: | April 1, 2012 through June 30, 2012 |
| Inspectors: | S. Shaffer, Senior Resident Inspector (SRI), Division of Reactor Projects (DRP)<br>J. Ambrosini, SRI, DRP<br>J. Krafty, Resident Inspector (RI), DRP<br>B. Haagensen, RI, DRP<br>W. Raymond, SRI, DRP, Seabrook<br>J. Nicholson, Health Physicist, Division of Nuclear Materials Safety (DNMS)<br>O. Masnyk Bailey, Health Physicist, DNMS<br>J. Laughlin, Emergency Preparedness Inspector, Nuclear Security Incident Response, (NSIR) |
| Approved By: | Ronald R. Bellamy, PhD, Chief<br>Reactor Projects Branch 5<br>Division of Reactor Projects |

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## SUMMARY OF FINDINGS

IR 05000336/2012003**,** 05000423/2012003; 04/01/2012-06/30/2012**;** Millstone Power Station Units 1 and 2; Operability Determinations and Functionality Assessments.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. Inspectors identified one finding of very low safety significance (Green). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). The cross-cutting aspects for the findings were determined using IMC 0310, "Components Within Cross-Cutting Areas." Findings for which the SDP does not apply may be Green, or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

**Cornerstone: Mitigating Systems**

- Green. An NRC identified finding of very low safety significance (Green) was identified for Dominion's failure to adequately assess the operability of the Unit 3 Feedwater isolation valves, 3FWS*CTV41A, B, C and D in accordance with OP-AA-102-1001, "Development of Technical Guidance Basis to Support Operability Determinations," and C OP 200.18, "Time Critical Operator Action Validation and Verification." Specifically, Dominion did not properly validate or credit manual operator actions to isolate the main feedwater lines during a feedline break inside containment as a compensatory measure for degraded hydraulic valve actuators. Dominion entered this issue into their corrective action program (CAP) as condition report number 478020, and conducted a reanalysis of the operability determination. The finding is more than minor because it is similar to NRC Inspection Manual Chapter (IMC) 0612, Appendix E, "Examples of Minor Issues," Example 3.k; in that the inadequate assessment of operability resulted in a condition where there was a reasonable doubt on the operability of the feedwater isolation function and the feedwater isolation valves. This issue is associated with the Equipment Control attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, Dominion did not explicitly take credit for manual operator actions to trip the main feedwater pumps as a compensatory measure for the degraded capability of the 3FWS*CTV41 feedwater isolation valves to perform their safety function during a feedline break event inside containment. The inspectors determined this finding was not a design qualification deficiency resulting in a loss of functionality or operability, did not represent an actual loss of safety function of a system or train of equipment, and was not potentially risk-significant due to a seismic, fire, flooding, or severe weather initiating event. Therefore, the finding is considered to be of very low safety significance.

  The inspectors did not assign a cross cutting aspect to this finding because the finding was not reflective of current performance. Operability determination OD000237 was completed in 2009 and OP-AA-102-1001 does not require periodic reassessment of active operability determinations. (Section 1R15)

**Other Findings**

A violation of very low safety significance that was identified by Dominion was reviewed by the inspectors. Corrective actions taken or planned by Dominion have been entered into Dominion's corrective action program. This violation and corrective action tracking number are listed in Section 4OA7 of this report.

## REPORT DETAILS

Summary of Plant Status

Millstone Unit 2 began the inspection period operating at 100 percent power. Unit 2 reduced power to 30 percent on May 11 to add oil to the 'A' reactor coolant pump (RCP) motor. Unit 2 returned to 100 percent power May 17 and remained at or near 100 percent for the remainder of the inspection period.

Unit 3 began the inspection period operating at 100 percent power. Unit 3 reduced power to 93 percent on May 18 for turbine testing and secondary plant maintenance. Power was returned to 100 percent power on May 20 and remained at or near 100 percent for the remainder of the inspection period.

### 1. REACTOR SAFETY

**Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**

1R01 Adverse Weather Protection (71111.01 – 2 samples)

.1 Summer Readiness of Offsite and Alternate Alternating Current (AC) Power Systems

a. Inspection Scope

The inspectors performed a review of plant features and procedures for the operation and continued availability of the offsite and alternate AC power system to evaluate readiness of the systems prior to seasonal high grid loading. The inspectors reviewed Dominion's procedures affecting these areas and the communications protocols between the transmission system operator and Dominion. This review focused on changes to the established program and material condition of the offsite and alternate AC power equipment. The inspectors assessed whether Dominion established and implemented appropriate procedures and protocols to monitor and maintain availability and reliability of both the offsite AC power system and the onsite alternate AC power system. The inspectors evaluated the material condition of the associated equipment by interviewing the responsible system manager, reviewing condition reports (CR) and open work orders, and walking down portions of the offsite and AC power systems including the 345 kilovolt (KV) switchyard and transformers. Documents reviewed for each section of this inspection report are listed in the Attachment.

b. Findings

No findings were identified.

.2 External Flooding

a. Inspection Scope

During the week of April 23, the inspectors performed an inspection of the external flood protection measures for Millstone Nuclear Power Plant. The inspectors reviewed the Unit 2 Updated Final Safety Analysis Report (UFSAR), Chapter 2.4.2.2 and Unit 3

UFSAR Chapter 2.4.1.4**,** which depicted the design flood levels and protection areas containing safety-related equipment to identify areas that may be affected by internal flooding. The inspectors conducted a general site walkdown of all applicable external areas of Unit 2 and Unit 3, including the turbine building, auxiliary building, diesel generator (DG) buildings, intake structures, and fire pump house to ensure that Dominion erected flood protection measures in accordance with design specifications. The inspectors also reviewed operating procedures for mitigating external flooding during severe weather to determine if Dominion planned or established adequate measures to protect against external flooding events.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04Q – 5 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

Unit 2

- Reactor Building Closed Cooling Water (RBCCW) System, Facility 1 on May 1
- 'B' Emergency Diesel Generator (EDG) on May 25
- RBCCW System Facility 1 and 2 on June 18

Unit 3

- 'B' Train of the charging system, on May 2 & 3
- 'B' High Pressure Safety Injection (HPSI) System, on May 16

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, technical specifications (TS), work orders, CRs, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted system performance of their intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether Dominion staff had properly identified equipment issues and entered them into their CAP for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

.2 Full System Walkdown (71111.04S – 1 sample)

a. Inspection Scope

On May 11, 13, and 17, the inspectors performed a complete system walkdown of accessible portions of the Unit 3 Quench Spray System to verify the existing equipment lineup was correct. The inspectors reviewed operating procedures, surveillance tests, drawings, and equipment line-up check-off lists, to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, component lubrication and equipment cooling, hangar and support functionality, and operability of support systems. The inspectors performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. Additionally, the inspectors reviewed a sample of related CR and work orders to ensure Dominion appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Resident Inspector Quarterly Walkdowns (71111.05Q – 10 samples)

a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that Dominion controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in the area pre-fire plan, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for out of service (OOS), degraded or inoperable fire protection equipment, as applicable, in accordance with procedures.

Unit 2

- Auxiliary Building East Battery Room, Fire Area A-22 on April 3
- Auxiliary Building Computer Room, Fire Area A-27 on April 13
- Auxiliary Building Control Room Air Conditioning Room, Fire Area A-33 on May 1
- Auxiliary Building Diesel Day Tank Room ‘B’, Fire Area A-30 on May 4
- Auxiliary Building Air Handling Units, Fire Area A-32 on May 4
- Fire Pumphouse, Fire Area FP-2 on June 15
- East 480 Volt Load Center Room, Fire Area A-28 on June 29

Unit 3

- West Switchgear Room, Fire Area CB-1 on May 1
- Battery Room #4, Fire Area CB-6 on April 26
- Cable Spreading Room Fire Area CB-8 on May 18

b. Findings

No findings were identified.

.2 Fire Protection – Drill Observation (71111.05A – 1 sample)

a. Inspection Scope

The inspectors observed a fire brigade drill scenario conducted on April 26, which involved a fire in Battery Room 4 in the 'B' Essential Switch Gear room for Unit 3. The inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that Dominion personnel identified deficiencies, openly discussed them in a self-critical manner at the debrief, and took appropriate corrective actions as required. The inspectors evaluated specific attributes as follows:

- Proper wearing of turnout gear and self-contained breathing apparatus
- Proper use and layout of fire hoses
- Employment of appropriate fire-fighting techniques
- Sufficient fire-fighting equipment brought to the scene
- Effectiveness of command and control
- Search for victims and propagation of the fire into other plant areas
- Smoke removal operations
- Utilization of pre-planned strategies
- Adherence to the pre-planned drill scenario
- Drill objectives met

The inspectors also evaluated the fire brigade's actions to determine whether these actions were in accordance with Dominion's fire-fighting strategies.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)

Annual Review of Cables Located in Underground Bunkers/Manholes

a. Inspection Scope

The inspectors conducted an inspection of underground bunkers/manholes subject to flooding that contain cables whose failure could disable risk-significant equipment. The inspectors performed walkdowns of risk-significant areas, including manholes 3EMH*1A, 3EMH*1B, 3EMH*13B, and 3EMH*3B containing safety-related cables, to verify that the cables were not submerged in water, that cables and/or splices appeared intact, and to

observe the condition of cable support structures. When applicable, the inspectors verified proper sump pump operation and verified level alarm circuits were set in accordance with station procedures and calculations to ensure that the cables will not be submerged.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (711111.07A – 1 sample)

a. Inspection Scope

The inspectors reviewed the 'B' emergency diesel generator (EDG) heat exchangers (jacket water, lube oil cooler, air cooler) to determine its readiness and availability to perform its safety functions. The inspectors reviewed the design basis for the component and verified Dominion's commitments to NRC Generic Letter 89-13. The inspectors reviewed the results of previous inspections of the 21 EDG heat exchangers. The inspectors discussed the results of the most recent inspection with engineering staff and observed the as-found conditions. The inspectors verified that Dominion initiated appropriate corrective actions for identified deficiencies. The inspectors also verified that the number of tubes plugged within the heat exchanger did not exceed the maximum amount allowed.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11 – 3 samples)

.1 Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed a Unit 2 licensed operator simulator training on April 17, which included a loss of one train of 120 VAC vital instrument bus followed by a loss of coolant accident (LOCA). The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the TS action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

The inspectors observed Unit 3 licensed operator simulator training on May 1, which included loss of main feedwater and loss of all auxiliary feedwater. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications,

implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the TS action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

.2 Quarterly Review of Licensed Operator Performance in the Main Control Room

a. Inspection Scope

The inspectors conducted a four hour observation of the Unit 2 power reduction to 30 percent power to add oil to the 'A' RCP motor on May 11. The inspectors also conducted a four hour observation of the replacement of the #2 feed water regulating valve positioner on May 11 and the May 12 power ascension activities which included bringing the second feed pump on line and troubleshooting the moisture separator reheater low load valve. The inspectors observed control room briefings to verify that the briefings met the criteria specified in Dominion's Operations Standards and Expectations Handbook. Additionally, the inspectors observed test performance to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards.

The inspectors conducted a four hour observation of the Unit 3 control room operators on May 18. The control room operators reduced power from 100 percent to 93 percent, conducted turbine control, stop and combined intermediate valve testing and swapped from the 'C' condensate pump to the 'A' condensate pump. The inspectors observed control room briefings to verify that the briefings met the criteria specified in Dominion's Operations Standards and Expectations Handbook. Additionally, the inspectors observed test performance to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12 – 3 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structures, system or component (SSC) performance and reliability. The inspectors reviewed system health reports, CAP documents, maintenance work orders, and maintenance rule basis documents to ensure that Dominion was identifying and properly evaluating performance problems within the scope of the maintenance rule. For each sample selected, the inspectors verified that the SSC was properly scoped into the maintenance rule in accordance with 10 CFR

50.65 and verified that the (a) (2) performance criteria established by Dominion staff was reasonable. As applicable, for SSCs classified as (a) (1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a) (2). Additionally, the inspectors ensured that Dominion staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

Unit 2

- Circulating Water System on April 6 through April 9
- 125 VDC System on April 10, 11, and 26

Unit 3

- Recirculation Spray System on May 21 through May 23

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 8 samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that Dominion performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. The inspectors verified that Dominion personnel performed risk assessments as required by 10 CFR 50.65(a) (4) and that the assessments were accurate and complete. When Dominion performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the TS requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

Unit 2

- Emergent work associated with the restoration of trip circuit breaker (TCBs) 1, 2, 5, and 6 following their inadvertent opening on May 18
- Yellow Risk associated with the 'A' high pressure safety injection (HPSI) pump surveillance on May 29
- Emergent risk associated with the 'B' EDG disabled annunciator alarming unexpectedly following restoration from an air roll surveillance on June 3 and 4
- Red Risk for inoperable vital Bus 22E due to degraded high energy line break (HELB) barrier on June 8

Unit 3

- Emergent Risk EDG Sequencers removed from service on April 13 and 14
- Yellow Risk for closure of 3SIH*MOV8924 for RCS leak rate troubleshooting on April 16
- Emergent risk for 'B' EDG surveillance test common mode failure evaluation on May 30
- Emergent work on replacement of the Electro-Hydraulic Control Permanent Magnet Generator +22 VDC Power Supply on line on June 23

b. Findings

No findings were identified.

1R15 Operability Determinations (OD) and Functionality Assessments (71111.15 – 7 samples)

a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions:

Unit 2

- CR477237, Incorrect lamps found in Unit 2 Reactor Protection System on June 7
- ETE-MP-2012-1115, MPS-2 West 480V SWGR Room North Wall top of wall Fire/HELB Penetration Seals, Revision 0 on June 8
- CR478285, Cracks in 480V West Switchgear Block Wall on June 12
- CR478752, 'B' service water (SW) pump strainer flush valve, 2-SW-90B, failed in-service test (IST) stroke time on June 14

Unit 3

- CR476936 'B' EDG Surveillance Test Failure - Common Mode Evaluation for 'A' EDG Operability May 30
- OD000237 Update: 3FWS*CTV41 closing capabilities on May 10
- CR475356 Source/Intermediate Range NI Cable Grounds on May 17

The inspectors selected these issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the operability determinations to assess whether TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TS and UFSAR to Dominion's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled by Dominion. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

Introduction. The inspectors identified a Green finding for Dominion's failure to adequately assess the operability of the Unit 3 feedwater isolation valve (3FWS*CTV41A, B, C and D) hydraulic actuators to perform their safety function to isolate main feedwater during a feedwater line break (FLB) inside containment. Specifically, OD000237 incorrectly concluded that the feedwater isolation (FWI) function of these valves was degraded but operable because the main steam line break (MSLB) event analysis bounded the FLB inside containment. This conclusion was not correct because under certain conditions the MSLB was not the most limiting accident scenario due to the inadequate closing capability of the hydraulic actuators.

Description. On June 27, 2007, Dominion identified that the Unit 3 feedwater isolation valve hydraulic actuators for 3FWS*CTV41A, B, C and D were not adequately sized to fully close against the expected differential pressure during a large FLB inside containment (1800 psid). Dominion determined (in CR-7-07160 and OD MP3-014-07) the valves would not go fully closed until after the feedwater pumps had tripped and therefore, the FWI function was operable with a degraded margin. A subsequent review (in OD000237 completed in 2009) reaffirmed this conclusion. The justification for continued operability was based on the conclusion that the FLB event remained bounded by the MSLB event and that operator actions could be relied upon to manually trip the motor-driven main feedwater pump in time to reduce the differential pressure across the feedwater isolation valve, allowing the valve to go fully closed before containment limits were exceeded.

On May 10, 2012, the inspectors reviewed this active OD and determined that the justification for continued operations did not meet the requirements of OP-AA-102-1001, "Development of Technical Guidance Basis to Support Operability Determinations," Revision 6. Specifically, Dominion had concluded that the FWI function was operable because the MSLB accident bounded the FLB accident, the main steam break event had a greater energy release rate, and no further analysis was necessary to demonstrate safety. This analysis did not fully consider the impact of continued high temperature feedwater flow from full power conditions into containment and the subsequent challenge to the electrical equipment qualification temperature limits inside containment.

Additionally, the OD had concluded that operators could be relied upon to trip the main feedwater pump to terminate feedwater flow into containment without addressing the nine requirements in MP3-SFRM, "Safety Function Requirements Manual" or the requirements in C OP 200.18, "Time Critical Operator Actions Validation and Verification." These requirements are similar to the considerations in NRC Information Notice 97-078 which discuss a systematic assessment of the specific actions as well as a systematic validation of the time sequence. OD000237, Revision 1 did not explicitly take credit for a time credited operator action as a compensatory measure for the degraded SSC, but implied that operator action would be required to manually stop the main feedwater pump for this event. A time-credited operator manual action cannot be used to replace an automatic action where the SSC is in a degraded condition until this analysis has been completed satisfactorily.

Analysis. The inspectors determined that the failure to adequately evaluate the operability of the FWI function in an active OD as required by OP-AA-102-1001 was a performance deficiency that was reasonably within Dominion's ability to foresee and

correct. Traditional enforcement does not apply because the issue did not have any actual safety consequences or potential for impacting the NRC's regulatory function, and was not the result of any willful violation of NRC requirements.

The inspectors determined that the issue was more than minor because it is similar to example 3.k of IMC 0612 Appendix E, "Examples of Minor Issues." Specifically, the inadequate assessment of operability resulted in a condition where there is a reasonable doubt on the operability of the FWI function and the feedwater isolation valves. In addition, this degraded condition affects the equipment control attribute of the mitigating systems cornerstone to ensure the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. This issue challenges containment integrity and the environmental qualification of safety related equipment inside containment. The inspectors evaluated the finding using Phase 1, "Initial Screening and Characterization" worksheet in Attachment 4 to IMC 0609, "Significance Determination Process." The inspectors determined this finding was not a design qualification deficiency resulting in a loss of functionality or operability, did not represent an actual loss of safety function of a system or train of equipment, and was not potentially risk-significant due to a seismic, fire, flooding, or severe weather initiating event. Therefore, inspectors determined the finding to be of very low safety significance (Green).

The finding does not have a cross cutting aspect assigned because it did not reflect current performance. There is no explicit programmatic requirement for Dominion to periodically review operability determinations.

Enforcement. This finding does not involve enforcement action because no regulatory requirement violation was identified. Dominion entered this issue into their corrective action program (CR478020) and commenced an engineering technical evaluation (ETE-CME-2012-1013) to adequately justify continued operability. Because this finding does not involve a violation and has very low safety significance, it is it is identified as a finding. **(FIN 05000423/2012003-01, Inadequate Operability Determination for 3FWS*CTV41 Feedwater Isolation Valve Hydraulic Actuators.)**

1R18 Plant Modifications (71111.18 – 2 samples)

Temporary Modifications

a. Inspection Scope

The inspectors reviewed the temporary modifications listed below to determine whether the modifications affected the safety functions of systems that are important to safety. The inspectors reviewed 10 CFR 50.59 documentation and post-modification testing results, and conducted field walkdowns of the modifications to verify that the temporary modifications did not degrade the design bases, licensing bases, and performance capability of the affected systems.

Unit 3

- Temp Mod 3-12-010, “Install Temporary Instrumentation to Monitor ‘A’ EGLS Power Supply Voltages,” Revision 1
- Temp Mod 3-12-015 for 3MSS*V885 Gagging Device Installation

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 9 samples)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed the test procedure to verify that the procedure adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure was consistent with the information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed the test or reviewed test data to verify that the test results adequately demonstrated restoration of the affected safety functions.

Unit 2

- Replacement of TCB 2 on April 12
- Repairs to the P6D circulating water pump on April 20
- Maintenance outage for mechanical and electrical PMs on the ‘B’ Control Room Air Conditioning unit April 30 through May 2.
- Two year PM of the ‘C’ Charging Pump on May 9
- Replacement of the #2 FRV positioner on May 11
- Two year PM of the ‘B’ EDG on May 24 and 25

Unit 3

- Repairs on 3SWP*P2B booster pump for 3HVK*CHL2 chiller on April 28
- Repacking of 3RHS*HCV606 on May 10
- Repairs to 3MSS*V885 following failure of valve to close on June 23

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 10 samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs to assess whether test results satisfied TS, the UFSAR,

and Dominion procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

Unit 2

- SP 2403BA, Facility 1 ESAS UV, RSST and Sequencer Calibration and Functional Test on April 9
- SP 2604AO, HPSI IST, > 1750 psia, Facility 1 on April 10
- SP 2613M-001, Periodic DG Operability Test, Facility 1 (SIAS Start), on April 11
- SP2401GA-D, RPS Channel 'A-D' Bistable Trip Test, on May 16
- SP 2401H, Axial Shape Index Alarm Setpoint Check, on May 24
- SP 2612F-002, 'B' SW Pump IST, Facility 1, on June 13

Unit 3

- SP 3646A.8, Containment Train 'A' Isolation Valves - Slave Relay K630 Test on April 10 (CIV)
- SP 3646A.1, 'A' EDG Operational Test on May 15
- SP 3608.1, 'A' SI Pump Operational Test IST on May 16
- SP 3646A.2, 'B' EDG 24 hour Run and Restart Surveillance Test on May 29

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness**

1EP4 Emergency Action Level and Emergency Plan Changes ( 71114.04 – 1 sample)

a. Inspection Scope

The Nuclear Security and Incident Response headquarters staff performed an in-office review of the latest revisions of various Emergency Plan Implementing Procedures and of the Emergency Plan located under ADAMS accession numbers ML12068A262 and ML12125A154 as listed in the Attachment.

Dominion determined that in accordance with 10 CFR 50.54(q), the changes made in the revisions resulted in no reduction in the effectiveness of the Plan, and that the revised Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50. The NRC review was not documented in a safety evaluation report and does not constitute approval of licensee-generated changes; therefore, this revision is subject to future inspection.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06 – 1 sample)

Training Observations

a. Inspection Scope

The inspectors observed a simulator training evolution for Unit 2 licensed operators on April 17 which required emergency plan implementation by an operations crew. Dominion planned for this evolution to be evaluated and included in performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crew. The inspectors also attended the post-evolution critique for the scenario. The focus of the inspectors' activities was to note any weaknesses and deficiencies in the crew's performance and ensure that Dominion evaluators noted the same issues and entered them into their CAP.

b. Findings

No findings were identified.

## 4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

Initiating Events Performance Indicators (6 samples)

a. Inspection Scope

The inspectors reviewed Dominion's submittal of the Initiating Events Performance Indicator results for the period of July 1, 2011 through June 30, 2012**:**

Unit 2

- Unplanned Scrams per 7000 Critical Hours
- Unplanned Scrams with Complications
- Unplanned Transients per 7000 Critical Hours

Unit 3

- Unplanned Scrams per 7000 Critical Hours
- Unplanned Scrams with Complications
- Unplanned Transients per 7000 Critical Hours

To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors

also reviewed Dominion's operator narrative logs, CR, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 5 samples)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that Dominion entered issues into the CAP at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP**.**

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a semi-annual review of site issues, as required by Inspection Procedure 71152, "Problem Identification and Resolution," to identify trends that might indicate the existence of more significant safety issues. In this review, the inspectors included repetitive or closely-related issues that may have been documented by Dominion outside of the CAP, such as trend reports, performance indicators, major equipment problem lists, system health reports, maintenance rule assessments, and maintenance or CAP backlogs. The inspectors also reviewed individual issues identified during the NRC's daily CR review (Section 4OA2.1). The inspectors reviewed the Dominion quarterly trend report for the first quarter of 2012**,** conducted under PI-AA-200-2001, Trending, to verify that Dominion's personnel were appropriately evaluating and trending adverse conditions in accordance with applicable procedures.

b. Findings and Observations

No findings were identified.

The trend report consists of several graphs of the number of CRs per quarter that have been coded with various trend codes by the station trend coordinator. PI-AA-200-2001 states that the trend report is a high level report and the value of the report is in allowing the organization to focus on salient station issues without the need to sort through large amounts of distracting data. The report does not provide analysis of the trends. It was

not clear to the inspectors that the trend report provides any significant value to the target audience, managers and above, since it does not provide sufficient information to determine emerging station issues. Negative trends are forwarded to the applicable department for the necessary analysis. Additionally, the trend report is not a comprehensive listing of negative trends. The trend report listed only three negative trends. Past trend reports were more comprehensive because they contained negative trends identified by the departments. About a year and a half ago, Millstone switched to the Fleet trending procedure which is narrower in scope. Currently there is no single document that captures all the negative trends of the site.

The inspectors identified two instances where the guidance of PI-AA-200-2001 was not followed. The Attachment 13 template was not followed since the report does not contain a detailed analysis of the trends. Additionally, the status of the corrective actions for the open trends on Engineering Fundamentals and Configuration Control was not reported in the trend report as is required by section 3.7.2. Both of these issues are minor performance deficiencies since the requirement was administrative in nature and had no safety impact.

.3 Annual Sample: Review of the Operator Workaround Program (2 samples)

a. Inspection Scope

The inspectors performed a review of the Unit 2 and a separate review of Unit 3 operator workarounds. The inspectors reviewed the cumulative effects of the existing operator workarounds, operator burdens, existing operator aids and disabled alarms, and open main control room deficiencies to identify any effect on emergency operating procedure operator actions, and any impact on possible initiating events and mitigating systems. The inspectors evaluated whether station personnel had identified, assessed, and reviewed operator workarounds as specified in Millstone's procedure OP-AA-1700, Operations Aggregate Impact (OAI).

The inspectors reviewed the Dominion process to identify, prioritize and resolve main control room distractions to minimize operator burdens. The inspectors reviewed the system used to track these operator workarounds (OPSTAT database) and attended the weekly OAI meeting. The inspectors also toured the control room and discussed the current operator workarounds with the operators to ensure the items were being addressed on a schedule consistent with their relative safety significance.

b. Findings and Observations

No findings were identified.

The inspectors determined that the issues reviewed did not adversely affect the capability of the operators to implement abnormal or emergency operating procedures. The inspectors also verified that Dominion entered operator workarounds and burdens into the CAP at an appropriate threshold and planned or implemented corrective actions commensurate with their safety significance.

OP-AA-1700 states that the nuclear operations manager is responsible for implementing actions in maintain the OAI greater than or equal to 80. Dominion has not been effective in meeting the target OAI values as both units OAI values have been below 80 for 2012.

This is an internal Dominion metric and not an NRC requirement; therefore there is no violation of regulatory requirements.

.4 Annual Sample: Work Management Issues with Corrective Action Plan from ACE 017509

a. Inspection Scope

The inspectors performed an in-depth review of Dominion's apparent cause analysis (ACE) 18693 and corrective actions associated with CR428785, de-alloying of service water valves identified in ACE 17509. Specifically, ACE 18693 examined why the corrective action plan from ACE 17509 did not result in replacement of the de-alloying valves before leakage occurred.

The inspectors assessed Dominion's problem identification threshold, cause analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of Dominion's corrective actions to determine whether Dominion was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of Dominion's CAP and 10 CFR 50, Appendix B. In addition, the inspectors performed field walkdowns and interviewed engineering personnel to assess the effectiveness of the implemented corrective actions.

b. Findings and Observations

No findings were identified.

Dominion determined that the apparent cause was that Engineering failed to assess the risk as required by PI-AA-200 when applying for an extension to replace the de-alloying valves. The extension was based on workload and parts availability and not the risk associated with a continuing corrosion process. Dominion determined that a contributing cause was the Corrective Action Review Board's failure to assess the risk when granting the extension.

The inspectors reviewed the ACE and determined that Dominion had adequately identified the issue, and determined the cause and contributing causes. The inspectors determined that Dominion's extent of condition to review long-term correction actions for the past two years to verify that the extensions were properly evaluated for risk was adequate. The inspectors also determined that the corrective action assignments were appropriate.

The inspectors determined that some of the behaviors that were identified in the corrective actions for ACE 17509 were repeated in ACE 18693. Specifically, ACE 18693 Apparent Cause 1 (AC-1) and Contributing Cause 1 (CC-1) state that PI-AA-200 was not followed in the ACE 17509 corrective actions in that risk was not assessed when granting extensions for the valve replacements, yet extensions were granted for the ACE 18693 corrective actions to replace of seven of the twelve valves without a discussion of the probability of valve failure during the time period of the extension. Additionally, ACE 18693 CC-3 states that PI-AA-200 was also not followed in ACE 17509 corrective actions in that the valve replacements were not tracked in the corrective action process

through implementation, yet ACE 18693's CA208981 was closed to a PM work order and CA209022 was closed to a purchase order. Both of these actions were outside of the corrective action process. Both of these issues are minor performance deficiencies since the requirement was administrative in nature and there were no safety consequences.

The inspectors also noted that Corrective Action 04 (CA-04) for Engineering to perform an Effectiveness Review had not been assigned.

.5 Annual Samples: Unit 2 Process Radiation Monitors

a. Inspection Scope

The inspectors conducted an in-depth review of the Unit 2 process radiation monitors. Specifically, the continuous air monitors used for measuring radioactive particulates, Iodine and gaseous activity concentrations were selected for a review of previous problem identification and implementation of corrective actions. The inspectors reviewed CR, causal evaluations, work orders, and operating and maintenance procedures.

The inspectors assessed Dominion's problem identification threshold, cause analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of Dominion's corrective actions to determine whether Dominion was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of Dominion's CAP and 10 CFR 50, Appendix B. In addition, the inspectors performed field walkdowns and interviewed engineering personnel to assess the effectiveness of the implemented corrective actions. The inspectors also interviewed technicians and supervisors in the Operations, HP and I&C departments.

b. Findings and Observations

No findings were identified.

The Unit 2 radiation process monitors RM-8262A/B and RM-8123A/B (Containment Air Monitor – Particulate Monitors) were modified to accept a standardized CP200 or 300 Iodine filter cartridge in 2004. This modification was not controlled under the design modification process and resulted in the installation of a filter adapter that was difficult to successfully install without causing air leakage into the system. If sufficient air leakage existed, the monitor could potentially become inoperable. A review of the Control Room narrative logs and plant process computer (PPC) data for a one year period showed that at no time were both channels OOS at the same time and therefore no violation of TS occurred. Recently, these monitors were restored to the original design configuration by reinstalling the correct vendor-supplied filter cartridges after Dominion identified the issue and corrected the problem.

The Unit 2 radiation process monitors RM-8434A/B (Radwaste Vent Monitor) and RM-8145A/B (Fuel Handling Building Exhaust Air Monitor) are not currently subjected to programmatic license requirements (TS, TRM, ODCM or EALs). Specifically, these NMC monitors are of an older design and have limited commercially available supply

vendor support. As a result, obtaining spare parts for these monitors has been difficult and equipment failures have required repair of obsolete circuit boards at the component level. In addition, the Iodine filter cartridges in these monitors were modified to accept CP-200 / 300 filter cartridges using an adaptor that was not subjected to the design modification process. These process monitors remain in this condition and may be subjected to air in-leakage because of adapter o-ring degradation and poor design/modification fit. The particulate filter paper rolls are no longer available and the filter paper was replaced with fixed paper instead of continuously advancing paper. These monitors are listed in Table 7.5-6 of the FSAR as part of the Unit 2 airborne process/effluent radiation monitor system. The functionality of these monitors has been the subject of many CRs and has been historically problematic.

Responsibility for the operations and maintenance of the Unit 2 radiation monitors is divided between several groups including Operations, I&C and HP. This situation results in the diversification of tasks and fragmentation of ownership with the resulting outcome that maintenance and corrective actions have historically not been well coordinated or effective. Coordination of setpoints for the Unit 2 radiation monitors has also been confusing as several documents have provided conflicting guidance. This situation has resulted in radiation monitor setpoints being incorrect with the result that the monitors were non-functional for various periods of time. However, a careful review of PPC data verified that no process monitors had been operated without complying with TS LCOs and action statements.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 3 samples)

.1 (Closed) Licensee Event Report (LER) 05000336/2011-005-00: Unit 2 Enclosure Building Rendered Inoperable Due to Degraded Door Seal

On December 3, 2011, Dominion discovered that a door sweep became dislodged on a boundary door for the Enclosure Building. As a result, the Enclosure Building was inoperable because there was no bounding analysis to assure that the safety function of the building to control the release of radioactive material was maintained. Dominion repaired the door and determined that 21 hours had elapsed from the time the door was last satisfactorily checked until the time it was repaired. This was less than TS 3.6.5.2, “Enclosure Building” 24 hour LCO action statement. The inspectors reviewed the LER and identified no findings and determined that no violation of NRC requirements occurred. This LER is closed.

.2 (Closed) LER 05000423/2011-003-01: Unit 3 Reactor Trip due to a Loss of Condenser Vacuum

On November 20, 2011, during a plant startup following a refueling outage, Unit 3 tripped at 1.7 percent power when a loss of the auxiliary boiler caused a loss of gland sealing steam to the main turbine which caused a loss of vacuum to the main condenser. The operators manually tripped the reactor as required by AOP 3559, “Loss of Condenser Vacuum.” AOP 3559 did not differentiate between above and below P-10 operations. Dominion restarted the auxiliary boiler, restored gland sealing steam and condenser vacuum, and returned Unit 3 to criticality. The inspectors reviewed the LER and identified no findings and determined that no violation of NRC requirements occurred. This LER is closed.

.3 (Closed) LER 05000423/2012-001: Unit 3 Main Steam Line Pressure Transmitters Declared Inoperable

On February 9, 2012 while operating at 100% power, Dominion discovered that all 12 main steam line steam generator pressure transmitters had been reinstalled without using new gaskets as required by Equipment Qualification Record following maintenance performed from January 17 to February 9. Immediately upon discovery, the operators declared the pressure transmitters inoperable and entered Technical Specification Action Statement 3.0.3 at 4:55 PM. New gaskets were installed and all 12 pressure transmitters were declared operable at 8:12 PM on February 9. Operation in Mode 1 with the pressure transmitters inoperable is contrary to the requirements of Technical Specification 3.3.2 (ESF Actuation System Instrumentation) and Technical Specification 3.3.3.6. (Accident Monitoring Instrumentation). The enforcement aspects of this issue are discussed in section 4OA7. The inspectors did not identify any new issues during the review of the LER. This LER is closed.

4OA5 Other Activities

Operation of an ISFSI at Operating Plants (IP 60855 and 60855.1)

a. Inspection Scope

The inspectors observed and evaluated Dominion's loading of the first of four canisters associated with the current Independent Spent Fuel Storage Installation (ISFSI) dry cask campaign for Unit 2. The inspectors verified compliance with the Certificate of Compliance (CoC), TS, regulations, and with Dominion's procedures. The inspectors also reviewed Dominion's activities related to long-term operation and monitoring of the ISFSI.

The inspectors observed the heavy load movement of the transfer cask (TC) and loaded dry shielded canister (DSC) from the spent fuel pool to the cask washdown pit next to the spent fuel pool. The inspectors also observed DSC processing operations including: decontamination and surveying, welding, non-destructive weld examinations, DSC draining, vacuum drying, helium backfilling, and leak testing. During performance of the activities, the inspectors evaluated Dominion's familiarity with procedures, supervisory oversight, and communication and coordination between the personnel involved. The inspectors also reviewed loading and monitoring procedures and evaluated Dominion's adherence to these procedures.

The inspectors performed tours of the ISFSI pad to assess the material condition of the pad and the loaded horizontal storage modules (HSMs). The inspectors also reviewed the as low as reasonably achievable (ALARA) goal for the loading of the first cask to determine the adequacy of Dominion's radiological controls and to ensure that radiation worker doses were ALARA and that project dose goals could be achieved.

The inspectors attended licensee briefings to assess their ability to identify critical steps of the evolution, potential failure scenarios, and human performance tools to prevent errors.

The inspectors reviewed Dominion's program associated with fuel characterization and selection for storage. The inspectors reviewed cask fuel selection packages to verify that

Dominion was loading fuel in accordance with the CoC and TS. Dominion did not plan to load any damaged fuel assemblies during this campaign.

At the time of this inspection, the inspectors noted that the temperature monitoring system for the loaded HSMs was not operational (condition report 474341). The inspectors verified that Dominion was appropriately implementing compensatory measures in accordance with TS requirements for HSM surveillance.

The inspectors reviewed corrective action reports and the associated follow-up actions that were generated since Dominion's last loading campaign to ensure that issues were entered into the CAP, prioritized, and evaluated commensurate with their safety significance. The inspectors also reviewed Dominion's 10 CFR 72.48 screenings.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On July 16, the inspectors presented the inspection results to Stephen E. Scace, Site Vice President, and other members of the Millstone staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

On April 19, Ronald Bellamy, NRC Branch Chief for Millstone, presented and discussed the 2011 end-of cycle performance assessment of the Millstone Nuclear Power Station with Mr. Stephen Scace, Site Vice President, and other members of the Millstone staff. The licensee acknowledged the assessment and planned regulatory oversight. This discussion was completed prior to a public open-house meeting on April 19. (ADAMS Accession ML# 12093A083).

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by Dominion and is a violation of NRC requirements which meets the criteria of the NRC Enforcement Policy for being dispositioned as an NCV.

Technical Specification 3.3.2 states, in part, that The Engineered Safety Features Actuation System instrumentation channels and interlocks shown in Table 3.3-3 shall be operable with their Trip Setpoints set consistent with the values shown in the Nominal Trip Setpoint column of Table 3.3-4. TS 3.3.3.4 states in part that these accident monitoring channels shall be operable. Contrary to these requirements, all main steam line steam generator pressure transmitters were reinstalled after maintenance using gaskets that were not environmentally qualified for use in an accident environment, thereby rendering these transmitters inoperable from January 17 through February 9, a condition prohibited by TS. Dominion identified the condition and immediately entered TS 3.0.3. Dominion replaced the gaskets and restored full EQ qualification to all main steam line pressure transmitters while complying with the action statements of TS 3.0.3, and entered the issue into the corrective action program as condition report CR462222.

The inspectors determined that the finding was of very low safety significance (Green) in accordance with NRC IMC 0609, Attachment 4, “Phase 1 – Initial Screening and Characterization of Findings”. The inspectors determined this finding was not a design qualification deficiency resulting in a loss of functionality or operability, did not represent an actual loss of safety function of a system or train of equipment, and was not potentially risk-significant due to a seismic, fire, flooding, or severe weather initiating event.

**ATTACHMENT: SUPPLEMENTARY INFORMATION**

## SUPPLEMENTARY INFORMATION

## KEY POINTS OF CONTACT

Licensee Personnel

| | |
|---|---|
| M. Adams | Plant Manager |
| L. Armstrong | Manager, Training |
| R. Acquaro | Unit 3 Shift Manager |
| G. Auria | Nuclear Chemistry Supervisor |
| B. Bartron | Supervisor, Licensing |
| R. Bonner | Supervisor Nuclear Engineering |
| E. Brodeur | Unit 3 Shift Manager |
| C. Chapin | Assistant Operations Manager |
| W. Chestnut | Supervisor, Nuclear Shift Operations Unit 2 |
| F. Cietek | Nuclear Engineer, PRA |
| T. Cleary | Licensing Engineer |
| G. Closius | Licensing Engineer |
| M. Cote | Nuclear Technical Specialist III |
| L. Crone | Supervisor, Nuclear Chemistry |
| J. Curling | Manager, Protection Services |
| P. Dillon | Nuclear Engineer III |
| J. Dorosky | Health Physicist III |
| M. Finnegan | Supervisor, Health Physics, ISFSI |
| T. Fisher | Unit 3 Work Control SRO |
| A. Gharakhanian | Nuclear Engineer III |
| W. Gorman | Supervisor, Instrumentation & Control |
| J. Grogan | Assistant Operations Manager |
| K. Grover | Manager, Nuclear Operations |
| W. Harrelson | Unit 3 Unit Supervisor |
| C. Hollis | Unit 3 Unit Supervisor |
| C. Houska | I&C Technician |
| J. Kelly | Unit 3 RO |
| B. Kelly | Unit 3 Unit Supervisor |
| M. King | I&C Supervisor |
| J. Kunze | Supervisor, Nuclear Operations Support |
| J. Laine | Manager, Radiation Protection/Chemistry |
| M. Logan | I&C Technician |
| S. Loser | I&C Supervisor |
| E. Lupine | Unit 3 Reactor Operator (UI) |
| R. MacManus | Director, Nuclear Station Safety & Licensing |
| G. Marshall | Manager, Outage and Planning |
| C. Massung | Unit 3 I&C Technician |
| C. Maxson | Manager, Nuclear Oversight |
| K. Miles | Unit 2 HP Supervisor |
| B. Nichols | Unit 3 STA |
| M. O'Conner | Assistant Manager for Outage and Planning |
| R. Riley | Supervisor, Nuclear Shift Operations Unit 3 |
| M. Roche | Senior Nuclear Chemistry Technician |
| L. Salyards | Licensing, Nuclear Technology Specialist |

| | |
|---|---|
| S. Saulter | Nuclear Mechanic Level III |
| S. Scace | Site Vice President |
| R. Schmidt | Unit 3 RO |
| J. Semancik | Plant Manager |
| A. Smith | Asset Management |
| D. Smith | Manager, Emergency Preparedness |
| S. Smith | Manager, Engineering |
| M. Socha | Unit 3 Unit Supervisor |
| J. Stoddard | Unit 3 Shift Manager |
| D. Tilton | Supervisor Nuclear Engineering |
| S. Turowski | Supervisor, Health Physics Technical Services |
| R. Vigneau | Unit 3 Unit Supervisor |
| C. Vournazos | IT Specialist, Meteorological Data |
| R. Walsh | Unit 3 Reactor Operator |
| S. Wiese | Unit 2 Unit Supervisor |
| C. Wooten | Work Planning Specialist |

## LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

| | | |
|---|---|---|
| Closed | | |
| 05000423/2011-003-01 | LER | Unit 3 Reactor Trip due to Loss of Condenser Vacuum (Section 4OA3) |
| 05000336/2011-005-00 | LER | Enclosure Building Rendered Inoperable Due to Degraded Door Seal (Section 4OA3) |
| 05000423/2012-001 | LER | Unit 3 Main Steam Line Pressure Transmitters Declared Inoperable (Section 4OA3) |
| Opened/Closed | | |
| 05000423/2012003-01 | FIN | Inadequate Operability Determination for 3FWS*CTV41 Feedwater Isolation Valve Hydraulic Actuators (Section 1R15) |

## LIST OF DOCUMENTS REVIEWED

### Section 1R01: Adverse Weather Protection

Procedures
AOP 2560, Storms, High Winds and High Tides, Revision 010-07
AOP 3569, Severe Weather Conditions, Revision 018
C OP 200.8, Response to ISO New England/CONVEX Notifications and Alerts, Revision 004-06
SP 2665, Building Flood Gate Inspections, Revision 005-03

Miscellaneous
CR350386
CR350395
CR 440310
CR472492
CR473049
CR473229
Fire Doors, Barriers and Buildings System Health Report, 1st Quarter 2012
MRE014129
Switchyard System Health Report, 1st Quarter 2012
Unit 2 NSST, RSST and Main Transformer System Health Report, 1st Quarter 2012
Unit 3 NSST, RSST, Main Transformers, and ISO-Phase System Health Report, 1st Quarter 2012

### Section 1R04: Equipment Alignment

Procedures
OP 2326A-001, SW Alignment Verification, Facility 1, Revision 000-06
OP 2330A-001, RBCCW System Alignment, Facility 1, Revision 000-05
OP 2330A-002, RBCCW System Alignment, Facility 2, Revision 000-05
OP 2330A-003, 'A' Pump is Supplying 'A' HX and 'C' Pump is Supplying 'C' HX With 24C Supplying 24E, Revision 000-00
OP 2346B-001, DG Fuel Oil Tank Valve Alignment, Revision 000-01
OP 2346B-003, 'B' DG Fuel Oil Valve Alignment, Revision 000-00
OP 2346C-004, 'B' DG Service Water Valve Alignment, Revision 000-04
OP 2346C-005, 'B' DG Starting Air Valve Alignment, Revision 000-00
OP 2346C-006, 'B' DG Jacket Water Valve Alignment, Revision 000-01
OP 2346C-007, 'B' DG Lube Oil Valve Alignment, Revision 000-03
OP 3304A, Charging and Letdown, Revision 031-04
OP 3308-004, Train 'B' HPSI, Revision 004-00
OP 3309-001, Quench Spray System (RWST) – Valve Lineup, Revision 005-02
OP 3309-002, Quench Spray System (Train A) – Valve Lineup, Revision 006-04
OP 3309-003, Quench Spray System (Train B) – Valve Lineup, Revision 005-04
OP 3309-4, Quench Spray System – Electrical Lineup, Revision 4-2
OP 3309-5, Quench Spray System – Instrument Lineup, Revision 4
OPS Form 3308-1, SIH Control Board Alignment, Revision 4, Change 1
SP 3609.1-002, Quench Spray Pump 3QSS*P3A Biennial IST Comprehensive Pump Test, Revision 000-02

Miscellaneous
Quench Spray and RWST System Heath Report, 1st Quarter 2011 and 2012

**Section 1R05: Fire Protection**

Procedures
EOP 3509, "Fire Emergency," Revision 024-02

Miscellaneous
Fire Protection Program Health Report, 1st Quarter 2012
Millstone Unit 2 Firefighting Strategies, April 2002
Millstone Unit 3 Fire Fighting Strategies, October 2001
MNP3 Fire Protection Evaluation Report, Revision 17.3
U2-24-FPP-FHA, Millstone Unit 2 Fire Hazards Analysis, Revision 12
Drill Package for Fire Area CB-6 at Unit 3, Revision March 2012

**Section 1R06: Flood Protection Measures**

Maintenance Orders/Work Orders
AWO 53102454188
AWO 53102484347

**Section 1R07: Heat Sink Performance**

Procedures
ER-AA-HTX-1002, Heat Exchanger Visual Inspection Form – Tubeside, Revision 1
MP 2701J-096, Heat Exchanger "As Found" Inspection Checklist, Revision 007-01

**Section 1R11: Licensed Operator Requalification Program**

Procedures
SP 3623.2, "Turbine Overspeed Protection System Test," Revision 009-10
SP 3623.2-002, "Cycle Test of HP Turbine Control Valves, Stop Valves and LP Combined Intermediate Stop and Intercept Valves," Revision 010-04
OP 3319, "Condensate," Revision 019-03

Condition Reports
CR473316
CR475030

Miscellaneous
Unit 2 LORP, Evaluated Simulator Exam (ES12301A)
Unit 3 LORT, simulator examination 14

**Section 1R12: Maintenance Effectiveness**

Procedures
MP 2703B1, Unit 2 Circulating Water Pump Overhaul, Revision 010-07

Condition Reports
CR445935
CR467953
CR472422

Miscellaneous
ACE 18977
(a)(1) Action Plan for the Circulating Water System
Circulating Water, Waterbox Priming and Screenwash System Heath Report, 1st Quarter 2011 and 1st Quarter 2012
Maintenance Rule Scoping Table for the Circulating Water System
Maintenance Rule Scoping Table for the Recirculation Spray System
Maintenance Rule Scoping Table for the 125 VDC System

| | | |
|---|---|---|
| MRE011791 | MRE013180 | MRE014154 |
| MRE011802 | MRE013376 | MRE014270 |
| MRE012189 | MRE013509 | MRE014272 |
| MRE012272 | MRE013545 | MRE014693 |
| MRE012669 | MRE013568 | MRE014705 |
| MRE012938 | MRE014143 | MRE014882 |

SO-12-010, Monitoring 'A' and 'B' Circulating Water Pump Discharge Pressures
125 VDC System Health Report, 1st Quarter 2011 and 2012
125 VDC Unavailability, April 2010 to March 2012
Drawing 12179-EM-133B-44
System Description, Recirculation Spray System
Maintenance Rule Database
Maintenance Rule Function System 03-CRS3306
Maintenance Rule Performance Criteria
RSS Unavailability Log
Operator Logs

**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

Procedures
AOP 2503E, Loss of 480 VAC Bus 22E, Revision 003-12
SP 2601D, Power Range Safety Channel Delta T Power Channel Calibration, Revision 016-02
SP 2619A, Control Room Shift Check, Revision 014-03
WM-AA-301-Attachment 14, "High Risk Contingency Plan Actions, Unit 3 'A' EGLS Sequencer" dated April 10
SP 3646A.2, "EDG 'B' Operability Test," Revision 018-08
MA-AA-103 Attachment 2, "Troubleshooting Sheet"
WM-AA-100, Work Management, Revision 17
WM-AA-301 Attach 14, "High Risk Contingency Plan Actions, +22 VDC EHC PMG Power Supply Replacement," dated June 21, 2012

Condition Reports

| | | |
|---|---|---|
| CR467765 | CR476936 | CR478194 |
| CR475700 | CR476983 | CR478246 |
| CR475723 | CR477532 | CR479766 |

Miscellaneous
Temp Mod 3-12-010, “Install temporary instrumentation to monitor ‘A’ EGLS power supply voltages,” Revision 1
Operator EOOS Risk Reports for April 13, 2012 – EGLS OOS
Operator EOOS Risk Report for April 16, 2012 – Closure of 3SIH*MOV8924
Operator EOOS Risk Profile (Yellow) for Unit 3 for May 30, 2012 – Common mode failure evaluation for ‘A’ and ‘B’ EDGs
Engineering Log Entry 5/30/2012 at 12:10 PM, “Unit 3 EDG Common Mode Evaluation for the ‘B’ EDG not reaching 110% Load”

**Section 1R15: Operability Evaluations**

Procedures
OP-AA-102-1001, “Development of Technical Basis to Support Operability Determinations,” Revision 6
SP 3646A.2, “EDG ‘B’ Operability Test,” Revision 018-08

Condition Reports

| | | |
|---|---|---|
| CR316335 | CR475365 | CR478194 |
| CR474338 | CR476936 | |
| CR474576 | CR476983 | |

Miscellaneous
Engineering Log Entry 5/30/2012 at 12:10 PM, “Unit 3 EDG Common Mode Evaluation for the ‘B’ EDG not reaching 110% Load”
OD000237 (MP3-014-07), “MP3 Feedwater isolation trip valves – 3FWS*CTV41A, B, C and D,” Revision 1
OD MP3-014-07, “3FWS*CTV41’s Closing Capability Against Main Feedwater Shutoff Pressure is Non-Conforming to Current Industry Requirements,” dated August 21, 2007
Memo MP3-DE-96-467, “MP3-Feedwater Overpressurization, DCR M3-96060,” dated June 13, 1996
MP 3760DB, “SG FWIV – Hydraulic Fluid and N2 Levels,” Revision 008-03
ETE-CME-2012-1013, “ETE to support OD000237 (formerly MP3-014-07) Containment Analysis for Feedwater Line Break with FWIV Partially Open,” Revision 0
ETE-CME-2012-1013, “ETE to support OD000237 (formerly MP3-014-07) Containment Analysis for Feedwater Line Break with FWIV Partially Open,” Revision 1
AR 07003963, “CR-07-072160 Hydraulic Control Units Design Thrust Capabilities,” dated June 28, 2007
AR 09000291, “Recommended setpoint, design and procedure changes for MSVB REA AR Tracking CR324298,” dated February 23, 2009
SFRM change Notice DM3-00-0033-12, Section 2.17 “Credited Operator Actions” dated March 2012

**Section 1R18: Plant Modifications**

Condition Reports
CR467765
CR479705
CR479770

Maintenance Orders/Work Orders
AWO 53102220910
AWO 53102535134

Miscellaneous
Temp Mod 3-12-010, "Install temporary instrumentation to monitor 'A' EGLS power supply voltages," Revision 1
Temp Mod 3-12-015, "Installation of Gagging Device for Valve 3MSS*V885," Revision 0

**Section 1R19: Post-Maintenance Testing**

Procedures
OP 2304E21, 'C' Charging Pump Post Maintenance Testing, Revision 000-03
OP 23465C-002, 'B' DG Data Sheet, Revision 001-08
SP 2401D, RPS Matrix Logic and Trip Path Relay Test, Revision 013-10
SP2401NE, RPS TCB Response Time Test, Revision 000-03
SP 2404AZ2, CRACs Facility Z2 Area Radiation Monitor RIT-9799B Functional Test, Revision 002-03
SP 2601H-007, 'C' Charging Pump Comprehensive Test, Revision 000-01
SP 2613B-001, Periodic DG Operability Test, Facility 2 (Loaded Run), Revision 021-06
SP 2613L-001, Periodic DG Slow Start Operability Test, Facility 2 (Loaded Run), Revision 004
SP 2624B-002, 'B' EDG Train 'A' Starting Air Vent Valve IST, Revision 002-01
SP 2624D-00`, 'B' EDG Starting Air Tank Check Valves IST, Revision 000-00
SP 2670-007, DG 'B' HX D/P Determination, Revision 001-05
SP 3626.9, "Control Building Air Conditioning Booster Pump 3SWP*P2B Group 'A' Test," Revision 011-05
SP 3610A.7, "RHR Valve Operability Test – Train 'A' (Quarterly)," Revision 009-01
DWG 12179-EM-123A, "Main Steam and Reheat," Revision 51

Condition Reports

| | | |
|---|---|---|
| CR470361 | CR472305 | CR475857 |
| CR471242 | CR472338 | CR475883 |
| CR471552 | CR472450 | CR475899 |
| CR471952 | CR472708 | CR475900 |
| CR472295 | CR472954 | CR475936 |
| CR472411 | CR473088 | CR476445 |
| CR472743 | CR473340 | CR479705 |
| CR472297 | CR475825 | CR479770 |

Maintenance Orders/Work Orders

| | | |
|---|---|---|
| 53M20214565 | 53M20806400 | 53102463972 |
| 53M20505416 | 53M20806423 | 53102484059 |
| 53M20505417 | 53102220910 | 53102490839 |
| 53M20612240 | 53102270210 | 53102498887 |
| 53M20612241 | 53102336660 | 53102505395 |
| 53M20612242 | 53102363527 | 53102506972 |
| 53M20612244 | 53102379763 | 53102508919 |
| 53M20702732 | 53102381185 | 53102535134 |
| 53M20707071 | 53102420017 | |
| 53M20802684 | 53102437760 | |

Miscellaneous
MP-20-WP-GLD-40 Attachment 2, "Post Maintenance Test Plan for AWO53102505395" dated May 8, 2012
MP-20-WP-GLD-40 Attachment 2, "Post Maintenance Test Plan for AWO53102336660" dated May 7, 2012

**Section 1R22: Surveillance Testing**

Procedures
OP 2346A-004, 'A' DG Data Sheet, Revision 023-09
OP 2624A-003, 'A' EDG Train 'B' Starting Air Valves IST, Revision 002-01
OP 3346A-014, "EDG 'A' – Operating Log," Revision 012
OP 3308, "High Pressure Safety Injection," Revision 012-01
SP 2401GA-D, RPS Channel 'A-D' Bistable Trip Test Data Sheet, Revision 02-009
SP 2613K-001, Periodic DG Slow Start Operability Test, Facility 1 (Loaded Run), Revision 004
SP 2604AO-001, 'A' HPSI Pump and Check Valve IST, Revision 001
SP 2670-004, DG 'A' HX D/P Determination, Revision 001-05
SP3646A.8, "Slave Relay Testing Train 'A'," Revision 023-07
SP3646A.8-010, "Containment Isolation Phase A S920 – Relay K630, Slave Relay Actuation," Revision 002-02
SP3646A.1, "EDG 'A' Operability Test," Revision 018-08
SP3646A.1-001, "EDG 'A' Operability Test," Revision 018-03
SP 3646A.2, "EDG 'B' Operability Test," Revision 018-08
SP 3646A.2-001, "EDG 'B' Operability Test," Revision 018-08
SP3646A2-006, "EDG 'B' 24 Hour Run and Restart," Revision 001
SP 3608.1, "Safety Injection Pump 'A' Operational Test," Revision 011-01
SP3630.1, "Safety Injection Pump 'A' Quarterly IST Pump Test," Revision 009

Miscellaneous
CR470326
CR476936
CR476983
CR478752
DWG 12179-EM-113B, "High Pressure Safety Injection"

**Section 1EP4: Emergency Action Level and Emergency Plan Changes**

Millstone Power Station Emergency Plan, Revision 44
MP-26-EPI-FAP06, "Classification and PARs," Revision 7
MP-26-EPI-FAP07, "Notifications and Communications," Revision 14
MP-26-EPI-FAP10, "Dose Assessment," Revision 7

**Section 4OA2: Problem Identification and Resolution**

Procedures
EN 21235, "Millstone Unit 2 Radiation Monitor High Radiation Setpoints," Revision 003-00
DCM-01, "Program Policy and Overview," Revision 011-06
MP-08-MP-GDL06A, "Millstone Standard Practices for the Module Repair Facility," Revision 000-00
OP-AA-100, Conduct of Operations, Revision 20

OP-AA-1700, Operations Aggregate Impact, Revision 5
OP 2383A, “Process Radiation Monitor Systems,” Revision 020-09
PI-AA-100-1003, Self Evaluation, Revision 9
PI-AA-200, Corrective Action, Revision 19
PI-AA-200-2001, Trending, Revision 2
RPM 2.2.6, “Continuous Air Monitors,” Revision 014-01
RPM 2.2.12, “Containment Continuous Air Radiation Monitors,” Revision 005-03
RPM 4.1.11, “AMS-4, “Air Monitoring System Calibration,” Revision 003

Condition Reports

| | | |
|---|---|---|
| CR428785 | CR473657 | CR460889 |
| CR429517 | CR475836 | CR461043 |
| CR435736 | CR476457 | CR461044 |
| CR455628 | CR476944 | CR466810 |
| CR461274 | CR478034 | CR468440 |
| CR461538 | CR478179 | CR468443 |
| CR462657 | CR411794 | CR470114 |
| CR464034 | CR427879 | CR470335 |
| CR465107 | CR430630 | CR471069 |
| CR465933 | CR431456 | CR471303 |
| CR468406 | CR435173 | CR471690 |
| CR470721 | CR437238 | CR471926 |
| CR471570 | CR437625 | CR471438 |
| CR472003 | CR443254 | CR472002 |
| CR472760 | CR453545 | CR476429 |
| CR473559 | CR460542 | |

Drawings
Drawings 12179-EM-145A, 12179-EM-123A

Miscellaneous
Clearance 3C15-DTM99-004A
Corrective Action Trends Report 1st Quarter 2012
Engineering Department Performance Improvement Action Plan March 2012
Engineering Department Self Evaluation Meeting, April 26, 2012
ETE-MP-2011-0090, Structural Integrity Evaluation for MP3 Dealloyed Aluminum Bronze Valves, Revision 1
Millstone Power Station Self Evaluation Meeting, March 20, 2012
OD000421, Aluminum Bronze Valves, Revision 0
OP-AA-1700, “Operations Aggregate Impact,” Revision 5
OPSTAT Database
SAR001897

**Section 4OA3: Follow-Up of Events and Notices of Enforcement Discretion**

LER 2011-003-01, “Reactor Trip due to Loss of Condenser Vacuum”
RCE001071, “Manual Reactor Trip, Millstone Unit 3”
AOP 3559, “Loss of Condenser Vacuum,” Revision 009-02
AOP 3559, “Loss of Condenser Vacuum,” Revision 009-03
AWO 5310286476

**Section 4OA5: Other Activities**

Spent Fuel Handling Operations, OPS-FH 216, Revision 002-03
Dry Canister Loading, OP 2209H, Revision 001-08, May 31, 2012
PCI, PI-CNSTR-T-OP-250, Revision 2, Closure Welding of Dry Shielded Canisters at the Millstone and Kewaunee Stations
PCI General Quality Procedure GQP-9.0, Training Qualification Examination, and Certification of NDE Inspection and Testing Personnel in Accordance With SNT-TC-1A and CP-189
PCI GQP-9.2, High Temperature Liquid Penetrant Examination and Acceptance Standards for Welds
DSC Insertion Into HSM (ISFSI) COP 302.1, Revision 001-07, April 30, 2012
Vacuum Drying System Operations (ISFSI) COP 302.5, Revision 001-04, May 31, 2012
Transfer Cask Lift Yoke Inspections (ISFSI) CSP 604.3, Revision 000-03, May 10, 2012
Transfer Equipment Assembly, Disassembly, and Pre-operation Testing Instructions (ISFSI) CSP 604.4, Revision 000-05, May 31, 2012
Transfer Cask Pre-Job Inspection and Shipping Instructions (ISFSI) CSP 604.2, Revision 001-02, September 30, 2010 AND completed procedure May 22, 2012
Transfer Cask Lift Yoke Inspections (ISFSI) CSP 604.3, Revision 000-02, June 8, 2006 AND completed forms April 10, 2012 – May 11, 2012
VDS Instrument Calibrations (ISFSI) IC, Revision 0001-01C 24 AND completed May 2, 2012 – June 1, 2012
NUHOMS Canister MPS 32PT-S100-A-H2016 ISFSI Fuel Assembly Certification and Canister Loading Map completed May 31, 2012
ETE-NAF-2010-0004 Revision 1, Attachment 2 - Engineering Technical Evaluation CM-AA-ETE-101
Millstone Power Station Independent Spent Fuel Storage Installation 72.212 Report dated May 30, 2012
ETE-MP-2010-0006-Revision 1, CM-AA-400 Attachment 1, 50.59/72.48 Applicability Review February 24, 2011
DNAP-3004-Attachment 4, October 6, 2010
CM-AA-400 Attachment 1, March 15, 2012
CM-AA-400 Attachment 3, May 29, 2012
CM-AA-400 Attachment 3, March 22, 2012
CM-AA-400 Attachment 1, May 7, 2012
CM-AA-400 Attachment 3, May 7, 2012
SNM Inventory and Control EN 21001, Revision 024-00, August 23, 2011
Fuel Assembly Visual Examination for Dry Storage EN 21024, Revision 005-00 Attachment 2, completed May 14, 2012
TR-AA-210 Attachment 3 Training Program for Millstone Station Nuclear Fuel Handler Student Qualification Matrix June 4, 2012
Condition Report 474341

## LIST OF ACRONYMS

| | |
|---|---|
| AC | alternating current |
| ACE | apparent cause analysis |
| ADAMS | Agencywide Documents Access and Management System |
| ALARA | as low as reasonably achievable |
| CAP | Corrective Action Program |
| CFR | Code of Federal Regulations |
| COC | certificate of compliance |
| CR | condition report |
| DG | diesel generator |
| DNMS | Division of Nuclear Material Safety |
| DRP | Division of Reactor Projects |
| DRS | Division of Reactor Safety |
| DSC | dry shielded canister |
| EDG | emergency diesel generator |
| EP | emergency preparedness |
| FIN | finding |
| FLB | feedwater line break |
| FWI | feedwater islolation |
| HPSI | high pressure safety injection |
| HSM | horizontal storage module |
| IMC | Inspection Manual Chapter |
| ISFSI | Independent Spent Fuel Storage Installation |
| IST | in-service test |
| KV | kilovolt |
| LER | licensee event report |
| LOCA | loss of coolant accident |
| MSLB | main steam line break |
| NCV | non-cited violation |
| NEI | Nuclear Energy Institute |
| NSIR | Nuclear Security Incident Response |
| NRC | Nuclear Regulatory Commission |
| OAI | operational aggregate impact |
| OD | operability determination |
| OOS | out of service |
| PARS | Publicly Available Records |
| PI | performance indicator |
| RBCCW | reactor building closed cooling water |
| RCP | reactor coolant pump |
| RCS | reactor coolant system |
| SDP | Significance Determination Process |
| SSC | structure, system, or component |
| SW | service water |
| TC | transfer check |
| TCB | trip circuit break |
| TS | technical specifications |
| UFSAR | Updated Final Safety Analysis Report |

**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
**REGION I**
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

August 31, 2012

Mr. David Heacock
President and Chief Nuclear Officer
Dominion Resources
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION – NRC PROBLEM IDENTIFICATION AND RESOLUTION INSPECTION REPORT 05000336/2012010 AND 05000423/2012010

Dear Mr. Heacock:

On August 2, 2012, the United States Nuclear Regulatory Commission (NRC) completed an inspection at your Millstone Power Station, Units 2 and 3. The enclosed report documents the inspection results, which were discussed on August 2, 2012, with Mr. Stephen Scace, Site Vice President, and other members of your staff.

This inspection examined activities conducted under your license as they relate to identification and resolution of problems and compliance with the Commission's rules and regulations and conditions of your license. Within these areas, the inspection involved examination of selected procedures and representative records, observations of activities, and interviews with personnel.

Based on the samples selected for review, the inspectors concluded that Dominion was generally effective in identifying, evaluating, and resolving problems. In most cases, Dominion personnel identified problems, entered them into the corrective action program at a low threshold, and prioritized issues commensurate with their safety significance. Dominion appropriately screened issues for operability and reportability, and performed causal analyses that appropriately considered extent of condition, generic issues, and previous occurrences. The inspectors also determined that Dominion typically implemented corrective actions to address the problems identified in the corrective action program in a timely manner.

The inspectors concluded that Dominion adequately identified, reviewed, and applied relevant industry operating experience to Millstone Power Station operations. In addition, based on those items selected for review, the inspectors determined that in general, Dominion's self-assessments and audits were thorough.

This report documents three NRC-identified findings of very low safety significance (Green). Two of the findings were determined to involve violations of NRC requirements. However, because of the very low safety significance and because they have been entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs), consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest any NCV in this report, you should provide a written response within 30 days of the date of this inspection report,

with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington DC, 20555-0001; and the NRC Senior Resident Inspector at Millstone Power Station. In addition, if you disagree with the cross-cutting aspects assigned to the findings in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Senior Resident Inspector at Millstone Power Station.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/***RA***/

Ronald R. Bellamy, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Docket Nos.: 50-336, 50-423
License Nos.: DRP-65, NPF-49

Enclosure: Inspection Report 05000336/2012010 and 05000423/2012010
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington DC, 20555-0001; and the NRC Senior Resident Inspector at Millstone Power Station. In addition, if you disagree with the cross-cutting aspects assigned to the findings in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Senior Resident Inspector at Millstone Power Station.

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Sincerely,

/***RA***/

Ronald R. Bellamy, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Docket Nos.: 50-336, 50-423
License Nos.: DRP-65, NPF-49

Enclosure: Inspection Report 05000336/2012010 and 05000423/2012010
w/Attachment: Supplemental Information

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| ☑ SUNSI Review | | ☑ Non-Sensitive<br>☐ Sensitive | | ☑ Publicly Available<br>☐ Non-Publicly Available | |
|---|---|---|---|---|---|
| OFFICE | RI/DRP | RI/DRP | RI/DRP | | |
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| DATE | 08/29/12 | 08/30/12 | 08/31/12 | | |

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**U.S. NUCLEAR REGULATORY COMMISSION**

REGION I

| | |
|---|---|
| Docket Nos.: | 50-336, 50-423 |
| License Nos.: | DRP-65, NPF-49 |
| Report Nos.: | 05000336/2012010 and 05000423/2012010 |
| Licensee: | Dominion Nuclear Connecticut, Inc. |
| Facility: | Millstone Power Station, Units 2 and 3 |
| Location: | P.O. Box 128<br>Waterford, CT 06385 |
| Dates: | July 16, 2012 through August 2, 2012 |
| Team Leader: | Thomas C. Setzer, Senior Project Engineer<br>Division of Reactor Projects (DRP) |
| Inspectors: | Brian C. Haagensen, Millstone Resident Inspector, DRP<br>Sherlyn D. Ibarrola, Project Engineer, DRP<br>Eric D. Miller, Project Engineer, DRP |
| Approved by: | Ronald R. Bellamy, Chief<br>Reactor Projects Branch 5<br>Division of Reactor Projects |

## SUMMARY OF FINDINGS

IR 05000336/2012010 and 05000423/2012010; 07/16/2012 – 08/02/2012; Millstone Power Station; Biennial Baseline Inspection of Problem Identification and Resolution. The inspectors identified three findings in the areas of Prioritization and Evaluation of Issues; Effectiveness of Corrective Actions; and Self-Assessments and Audits.

This NRC team inspection was performed by three regional inspectors and one resident inspector. The inspectors identified three findings of very low safety significance (Green) during this inspection. Two findings were determined to involve violations of NRC requirements. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using NRC Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or assigned a severity level after NRC management review. Cross-cutting aspects associated with findings are determined using IMC 0310, "Components Within the Cross-Cutting Areas." The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

Problem Identification and Resolution

The inspectors concluded that Dominion was generally effective in identifying, evaluating, and resolving problems. In most cases, Dominion personnel identified problems, entered them into the corrective action program at a low threshold, and prioritized issues commensurate with their safety significance. Dominion appropriately screened issues for operability and reportability, and performed causal analyses that appropriately considered extent of condition, generic issues, and previous occurrences. The inspectors also determined that Dominion typically implemented corrective actions to address the problems identified in the corrective action program in a timely manner. However, the inspectors identified two violations of NRC requirements in the areas of Prioritization and Evaluation of Issues, and Effectiveness of Corrective Actions.

The inspectors concluded that Dominion adequately identified, reviewed, and applied relevant industry operating experience to Millstone Power Station operations. In addition, based on those items selected for review, the inspectors determined that in general, Dominion's self-assessments and audits were thorough. However, the inspectors identified one finding in the area of Self-Assessments and Audits that was determined not to be a violation of NRC requirements.

Based on the interviews the inspectors conducted over the course of the inspection, observations of plant activities, and reviews of individual corrective action program and employee concerns program issues, the inspectors did not identify any indications that site personnel were unwilling to raise safety issues, nor did they identify any conditions that could have had a negative impact on the site's safety conscious work environment.

**Cornerstone: Mitigating Systems**

- Green. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criteria XVI, "Corrective Action," for Dominion's failure to take prompt and effective corrective actions for conditions adverse to quality involving degradation of the Unit 3 turbine driven auxiliary feedwater (TDAFW) pump trip latch mechanism. Dominion did not identify the cause of the trip latch mechanism degradation until after multiple surveillance test failures had occurred.

In response to questions from NRC inspectors, Dominion performed additional troubleshooting and determined that the linkage was not properly lubricated, and the linkage impact gap was out of adjustment. Dominion lubricated and adjusted the linkage, and declared the TDAFW pump operable after a successful retest.

The inspectors determined that this issue was more than minor because it is similar to the more than minor example 4.f of Inspection Manual Chapter (IMC) 0612, Appendix E, "Examples of Minor Issues." Additionally, the finding was more than minor because it is associated with the Equipment Performance attribute of the Mitigating Systems cornerstone, and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The finding was determined to be of very low safety significance (Green) because the finding does not represent a loss of system and/or function, does not represent an actual loss of function of at least a single train for greater than its technical specification allowed outage time or two separate safety systems out-of-service for greater than its technical specification allowed outage time, and does not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's Maintenance Rule program for greater than 24 hrs. The inspectors determined that this finding had a cross-cutting aspect in the Problem Identification and Resolution cross-cutting area, Corrective Action Program component, because Dominion did not thoroughly evaluate the problem such that the resolution addressed the causes [P.1(c)]. (Section 4OA2.1.c)

**Cornerstone: Barrier Integrity**

- Green. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criteria XVI, "Corrective Action," for Dominion's failure to take timely corrective actions for conditions adverse to quality involving the degradation of the closing capability of four Unit 3 main feedwater isolation valves. Dominion has deferred correcting this condition adverse to quality for over a period of six years (three refueling outages), and correction of the degraded condition is currently scheduled for the next refueling outage (April 2013).

  The inspectors determined this issue was more than minor because it is similar to the more than minor examples, 4.f and 4.g of NRC IMC 0612, Appendix E, "Examples of Minor Issues." Additionally, the finding is more than minor because it is associated with the Design Control attribute of the Barrier Integrity cornerstone, and adversely affected the cornerstone's objective of providing reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. The inspectors determined the finding was of very low safety significance (Green) because the issue did not represent an actual open pathway in the physical integrity of the reactor containment. The inspectors determined this finding had a cross-cutting aspect in the Human Performance cross-cutting area, Decision Making component, because Dominion did not use conservative assumptions in decision making when delaying the repairs [H.1(b)]. (Section 4OA2.1.c)

**Other Findings**

- Green. The inspectors identified a finding (FIN) of very low safety significance (Green) for Dominion's failure to perform procedurally required effectiveness reviews for numerous formal self-assessments. Consequently, Dominion missed opportunities to identify potential

corrective actions for resolution in the corrective action program. Dominion has entered the issue into the corrective action program (CR482135).

The inspectors determined that this finding was more than minor because it is similar to IMC 0612, “Power Reactor Inspection Reports,” Appendix E, “Examples of Minor Issues,” example 3.j; in that, it represents a programmatic deficiency that could lead to worse errors if uncorrected. This finding was of very low safety significance (Green) because the finding does not represent a loss of system and/or function, does not represent an actual loss of function of at least a single train for greater than its technical specification allowed outage time or two separate safety systems out-of-service for greater than its technical specification allowed outage time, and does not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee’s Maintenance Rule program for greater than 24 hrs. This finding is not associated with an NRC Reactor Oversight Process cornerstone. The inspectors determined that this finding had a cross-cutting aspect in the Human Performance cross-cutting area, Work Practices component, because Dominion personnel failed to follow procedures. [H.4(b)]. (Section 4OA2.3.c)

## REPORT DETAILS

## 4. OTHER ACTIVITIES (OA)

4OA2 Problem Identification and Resolution (71152B)

This inspection constitutes one biennial sample of problem identification and resolution as defined by Inspection Procedure 71152. All documents reviewed during this inspection are listed in the Attachment to this report.

.1 Assessment of Corrective Action Program Effectiveness

a. Inspection Scope

The inspectors reviewed the procedures that described Dominion's corrective action program at Millstone Power Station. To assess the effectiveness of the corrective action program, the inspectors reviewed performance in three primary areas: problem identification, prioritization and evaluation of issues, and corrective action implementation. The inspectors compared performance in these areas to the requirements and standards contained in 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," and Dominion procedure PI-AA-200, "Corrective Action." For each of these areas, the inspectors considered risk insights from the station's risk analysis and reviewed condition reports selected across the seven cornerstones of safety in the NRC's Reactor Oversight Process. Additionally, the inspectors attended multiple Condition Report Review Team (CRT) meetings and Corrective Action Assignment Review Team (CAART) meetings. The inspectors selected items from the following functional areas for review: engineering, operations, maintenance, emergency preparedness, radiation protection, chemistry, physical security, and the Maintenance Rule program.

(1) Effectiveness of Problem Identification

In addition to the items described above, the inspectors reviewed system health reports, a sample of completed corrective and preventative maintenance work orders, completed surveillance test procedures, operator logs, and periodic trend reports. The inspectors also completed field walkdowns of various systems for both Unit 2 and Unit 3, such as the emergency core cooling pump rooms, auxiliary feedwater pump room, intake structure, turbine building, central alarm station, secondary alarm station, armory, and cable spreading rooms. Additionally, the inspectors reviewed a sample of condition reports written to document issues identified through internal self-assessments, audits, emergency preparedness drills, and the operating experience program. The inspectors completed this review to verify that Dominion entered conditions adverse to quality into their corrective action program as appropriate.

(2) Effectiveness of Prioritization and Evaluation of Issues

The inspectors reviewed the evaluation and prioritization of a sample of condition reports issued since the last NRC biennial Problem Identification and Resolution inspection completed in February 2010. The inspectors also reviewed condition reports that were assigned lower levels of significance that did not include formal cause evaluations to ensure that they were properly classified. The inspectors' review included the

appropriateness of the assigned significance, the scope and depth of the causal analysis, and the timeliness of resolution. The inspectors assessed whether the evaluations identified likely causes for the issues and developed appropriate corrective actions to address the identified causes. Further, the inspectors reviewed equipment operability determinations, reportability assessments, and extent-of-condition reviews for selected problems to verify these processes adequately addressed equipment operability, reporting of issues to the NRC, and the extent of the issues.

(3) Effectiveness of Corrective Actions

The inspectors reviewed Dominion's completed corrective actions through documentation review and, in some cases, field walkdowns to determine whether the actions addressed the identified causes of the problems. The inspectors also reviewed condition reports for adverse trends and repetitive problems to determine whether corrective actions were effective in addressing the broader issues. The inspectors reviewed Dominion's timeliness in implementing corrective actions and effectiveness in precluding recurrence for significant conditions adverse to quality. The inspectors also reviewed a sample of condition reports associated with selected NCVs and findings to verify that Dominion personnel properly evaluated and resolved these issues. In addition, the inspectors expanded the corrective action review to five years to evaluate Dominion's actions related to Unit 2 safety-related inverter issues.

b. Assessment

(1) Effectiveness of Problem Identification

Based on the selected samples, plant walkdowns, and interviews of site personnel in multiple functional areas, the inspectors determined that Dominion identified problems and entered them into the corrective action program at a low threshold. Dominion staff at Millstone Power Station initiated approximately 38,000 condition reports between January 2010 and July 2012. The inspectors observed supervisors at the CRT and CAART meetings appropriately questioning and challenging condition reports to ensure clarification of the issues. Based on the samples reviewed, the inspectors determined that Dominion trended equipment and programmatic issues, and appropriately identified problems in condition reports. The inspectors verified that conditions adverse to quality identified through this review were entered into the corrective action program as appropriate. Additionally, inspectors concluded that personnel were identifying trends at low levels.

During a plant walkdown, the inspectors identified two degraded conditions that had not been previously entered into the Dominion corrective action program:

- A radiological floor drain label was found to be covering a portion of a floor drain in the Unit 3 safeguards building, elevation 37'. The label was moved during painting of the floor and was blocking a portion of the drain. This was a performance deficiency because Dominion's work control program failed to identify the improperly placed label following work activities in the area. Dominion immediately entered the issue into the corrective action program as CR481939, and properly installed the label. Dominion evaluated the issue and determined the function of the drain was not adversely impacted by the label. The inspectors determined that because the label did not impact the function of

the floor drain, and that the issue was isolated and not programmatic in nature, this performance deficiency was minor and not subject to enforcement action in accordance with the NRC's Enforcement Policy.

- An extension ladder was found to be tied off to electrical conduit located in the Unit 2 'B' safeguards room. The ladder was being stored in the area to allow personnel access to an upper mezzanine area of the room. The inspectors questioned whether the ladder was adequately restrained to withstand a seismic event, and how long the ladder had been in the area. Dominion performed an evaluation and concluded that the ladder was properly restrained; however, it was not being stored in accordance with site housekeeping procedures. This was a performance deficiency because Dominion's housekeeping program failed to identify the improperly stored ladder. Dominion immediately entered the issue into the corrective action program as CR481975, removed the ladder, and determined that the ladder would not adversely impact the operability of safety-related equipment during a seismic event. The inspectors determined that because the issue did not affect equipment operability and was isolated and not programmatic in nature, this performance deficiency was minor and not subject to enforcement action in accordance with the NRC's Enforcement Policy.

(2) Effectiveness of Prioritization and Evaluation of Issues

The inspectors determined that, in general, Dominion appropriately prioritized and evaluated issues commensurate with the safety significance of the identified problem. Dominion screened condition reports for operability and reportability, categorized the condition reports by significance, and assigned actions to the appropriate department for evaluation and resolution. The condition report screening process considered human performance issues, radiological safety concerns, repetitiveness, adverse trends, and potential impact on the safety conscious work environment.

Based on the sample of condition reports reviewed, the inspectors noted that the guidance provided by Dominion corrective action program implementing procedures appeared sufficient to ensure consistency in categorization of issues. Operability and reportability determinations were generally performed when conditions warranted and in most cases, the evaluations supported the conclusion. Causal analyses appropriately considered the extent of condition or problem, generic issues, and previous occurrences of the issue. However, the inspectors identified one example of more than minor significance where Dominion personnel did not take timely corrective actions to correct a known degraded condition for Unit 3 main feedwater isolation valves. This finding is documented in Section 4OA2.1.c.

(3) Effectiveness of Corrective Actions

The inspectors concluded that corrective actions for identified deficiencies were, in general, timely and adequately implemented. For significant conditions adverse to quality, Dominion, in general, identified actions to prevent recurrence. The inspectors concluded that corrective actions to address the sample of NRC NCVs and findings since the last problem identification and resolution inspection were, in general, timely and effective. However, the inspectors found the following examples where corrective actions were not completed or fully effective to address an issue:

Millstone Corrective Action Program Workflow Extension Policy

In April 2012, Dominion implemented a new policy governing extensions of condition report due dates. The new policy was put in effect based on an assessment Dominion had completed which concluded the station had been inappropriately or excessively extending the due dates of corrective actions. If a due date is to be extended, the new policy requires specific levels of approval (Manager, Director, Site Vice President) based on the significance of the issue or number of previous extensions. The inspectors reviewed a list of 95 condition reports that had been extended since this policy was placed in effect, and randomly sampled 15 condition reports for a detailed review. The inspectors found that 11 of the 15 condition reports reviewed did not receive the proper approval per the new policy. The inspectors determined that the policy has not been effective since numerous condition report due dates were extended without following policy guidance. This was a performance deficiency because it is a failure to follow a self-imposed standard; however, it is not a violation of NRC requirements since the policy is not required by Dominion's operating license. The inspectors determined the issue was minor because even though the proper approvals were not received for the condition report due date extensions, Dominion had addressed each of the issues in a timely manner commensurate with the safety significance. Therefore, the inspectors determined the issue is not subject to enforcement action in accordance with the NRC's Enforcement Policy.

Abnormal Operating Procedure (AOP) 2579B

The inspectors reviewed corrective actions in apparent cause evaluation (ACE) 014108, which were written to address an NCV from a 2008 NRC triennial fire protection inspection. The NRC issued this NCV for Dominion's failure to demonstrate they could restore auxiliary feedwater to a steam generator within 30 minutes following a fire consistent with the Unit 2 fire safe shutdown analysis. A corrective action from the ACE was assigned to revise AOP 2579B to support operator success in meeting the time critical operator action of 30 minutes. The inspectors found that this enhancement was closed inappropriately with no work performed. However, subsequent to the NCV having been issued, Dominion performed an evaluation of operator actions that showed the station could meet the 30 minute requirement to restore auxiliary feedwater. Therefore, the inspectors determined that this issue did not represent a more than minor performance deficiency because Dominion had performed an evaluation that proved the operators could meet the 30 minute requirement despite the AOP having not been revised.

Unit 1 Emergency Preparedness Drill

The inspectors reviewed CR460177, which was written to document potential enhancements for emergency response following a December 2011 Unit 1 emergency preparedness training drill. The condition report was closed with no action taken on the enhancements. The condition report should have opened corrective actions to address each enhancement item. The inspectors determined this issue was minor because the items were enhancements and not required for adequate emergency response.

Unit 3 Tritium Found in Electrical Manhole

The inspectors reviewed corrective actions CA208029 and CA208030, which were associated with tritium found in electrical manhole 3EMH-3A. The corrective actions required engineering to evaluate capturing condensation before tritiated water vapor is introduced into the environment, and present the results of the evaluation to the station's plant health committee. Both corrective actions had requested due date extensions but were then improperly closed before the work was done. The inspectors determined that this issue did not represent a more than minor performance deficiency because the corrective actions were enhancement items and previous corrective actions completed by Dominion had effectively addressed the tritium issue. Therefore, this issue is not subject to enforcement action in accordance with the NRC's Enforcement Policy.

Finally, the inspectors identified one example of more than minor significance where Dominion personnel failed to take prompt and effective corrective actions for a degraded trip latch mechanism on the Unit 3 turbine driven auxiliary feedwater pump turbine. This finding is documented in Section 4OA2.1.c.

c. Findings

(1) Failure to Take Timely Corrective Actions to Restore Degraded Unit 3 Main Feedwater Isolation Valves

Introduction. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criteria XVI, "Corrective Action," for Dominion's failure to take timely corrective actions for conditions adverse to quality involving the degradation of the closing capability of four Unit 3 main feedwater isolation valves. Dominion has deferred correcting this condition adverse to quality for over a period of six years (three refueling outages), and correction of the degraded condition is currently scheduled for the next refueling outage (April 2013).

Discussion. On June 27, 2007, Dominion identified that four Unit 3 main feedwater isolation valves, 3FWS*CTV41A, B C, and D, would not positively close against main feedwater pump discharge pressure to isolate feedwater flow into containment in the event of a main feedwater line rupture. Further analysis concluded that the feedwater isolation would likely occur when the feedwater pumps were subsequently stopped by either a non-safety grade trip signal or manual operator action. The feedwater isolation valves are safety-related valves that comprise train "B" of the main feedwater isolation function as described in the Millstone Updated Final Safety Analysis Report (UFSAR). Dominion determined that the hydraulic actuators for these valves were inadequately sized based on operating experience as described in Electric Power Research Institute (EPRI) Technical Report TR-103232. The valves were initially scheduled to be restored to full qualification during refueling outage (RFO), 3RFO11, in October 2008, but the repairs were deferred to 3RFO12 due to maintenance schedule conflicts. Subsequently, repairs were not completed in either 3RFO12 or 3RFO13, and have been rescheduled to the upcoming refueling outage 3RFO14 in April of 2013, six years after the problem was first identified.

The main feedwater isolation valves are safety-related containment isolation valves that rapidly close in response to a phase "B" feedwater isolation emergency safeguards feature (ESF) signal. These valves are relied upon to ensure that the flow of hot

feedwater is rapidly isolated for a variety of analyzed events including the rupture of a feedwater header inside containment. If feedwater flow is not isolated to the break, the additional energy transported into containment may challenge containment pressure and temperature limits, as well as the equipment qualification of various instruments and equipment inside containment.

Dominion issued condition report CR483637 on August 1, 2012, and placed the motor-driven feedwater pump in pull-to-lock to prevent it from automatically starting if a drop in feed header pressure occurred from a feed header rupture. Dominion subsequently completed an immediate operability determination (IOD), which concluded that the feedwater isolation function was degraded but operable based upon the conclusion that the main feedwater pumps would likely trip within a short period of time. The non-safety grade main feedwater pump trip signal that would likely stop the pumps and operator actions would also manually stop the main feedwater pump while implementing emergency operating procedure E-0, “Reactor Trip or Safety Injection.”

Analysis. The inspectors determined that the failure to take timely corrective action following identification of a degraded condition of the Unit 3 main feedwater isolation valves was a performance deficiency that was reasonably within Dominion’s ability to foresee and prevent.

The inspectors determined this issue was more than minor because it is similar to the more than minor examples, 4.f and 4.g of NRC Inspection Manual Chapter (IMC) 0612, Appendix E, “Examples of Minor Issues.” Specifically, a condition adverse to quality was not corrected in a timely manner and resulted in a situation that impacted the operability of the feedwater isolation valves. Additionally, the finding is more than minor because it is associated with the Design Control attribute of the Barrier Integrity cornerstone, and adversely affected the cornerstone’s objective of providing reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events.

In accordance with NRC Inspection Manual Chapter 0609, Attachment 4, “Initial Characterization of Findings,” a Phase 1 significance determination process (SDP) screening was performed and determined the finding was of very low safety significance (Green) because the issue did not represent an actual open pathway in the physical integrity of the reactor containment. In the event of a ruptured feedwater line, the train “A” main feedwater regulating valves and bypass valves would remain capable of closing to isolate feedwater flow.

The inspectors determined this finding had a cross-cutting aspect in the Human Performance cross-cutting area, Decision Making component, because Dominion did not use conservative assumptions in decision making when delaying the repairs [H.1(b)]. Specifically, Dominion’s decision to defer repair of the main feedwater isolation valves was primarily based on the conclusions in OD00027, which determined the valves would be operable based on several non-conservative assumptions including an incorrect valve factor and not establishing compensatory actions to credit the main feedwater pump trip signal and manual time critical operator actions.

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, “Corrective Action,” requires, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and

equipment, and non-conformances are promptly identified and corrected. Contrary to the above, on June 27, 2007, Dominion did not take timely corrective actions to correct the degraded condition of the Unit 3 main feedwater isolation valves. Dominion has taken action to schedule the replacement of the main feedwater isolation valves in the next refueling outage (April 2013). Because this finding is of very low safety significance (Green) and has been entered into Dominion's corrective action program (CR483477), the NRC is treating this finding as an NCV, consistent with the NRC's Enforcement Policy. **(NCV 05000423/2012010-01, Failure to Take Timely Corrective Actions to Restore Degraded Unit 3 Main Feedwater Isolation Valves)**

(2) Failure to Take Prompt and Effective Corrective Actions to Address TDAFW Pump Trip Latch Mechanism Degradation

Introduction. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criteria XVI, "Corrective Action," for Dominion's failure to take prompt and effective corrective actions for conditions adverse to quality involving degradation of the TDAFW pump trip latch mechanism. Dominion did not identify the cause of the trip latch mechanism degradation until after multiple surveillance test failures had occurred. In response to questions from NRC inspectors, Dominion performed additional troubleshooting and determined that the linkage was not properly lubricated, and the linkage impact gap was out of adjustment.

Discussion. On November 17, 2011, the TDAFW pump turbine steam supply valve 3MSS*MSV5 failed to trip when the mechanical trip lever was depressed during a quarterly operational surveillance test. Initial troubleshooting efforts indicated that the trip latch mechanism had paint residue on the latch surface, and that the paint had interfered with the operation of the trip mechanism. The trip latch surfaces were cleaned and the trip latch was retested satisfactorily. On March 26, 2012, 3MSS*MSV5 again failed to trip when the mechanical trip lever was depressed during a quarterly operational surveillance test. Initial troubleshooting efforts indicated that rust particles had interfered with the operation of the trip mechanism. The trip latch surfaces were cleaned and the trip latch was retested satisfactorily. Finally on March 27, 2012, another surveillance test revealed that the mechanical latch again failed to trip. Additional troubleshooting did not reveal any additional causes of the failure, and the trip latch subsequently passed a surveillance test after it had been cleaned and exercised by maintenance. No condition report was written by Dominion for the failure on March 27. The TDAFW pump was subsequently declared operable on March 28, 2012.

On May 5, 2012, in response to questions from NRC inspectors, troubleshooting and testing conducted by Dominion revealed that the latching mechanism was excessively stiff. A pull test was conducted and the latching mechanism required 30 to 35 lbs to trip the latch. The vendor specification for the force required to trip the latch is less than 25 lbs force. Additional troubleshooting revealed that the linkage impact gap was out of proper adjustment. On May 8, 2012, Dominion lubricated and exercised the trip throttle linkage, reduced the force required to trip the latch to within specifications, and adjusted the impact gap to the proper dimensions. The trip latch was then retested satisfactorily.

The inspectors determined that Dominion did not perform adequate troubleshooting on the trip latch mechanism, such as verifying the linkage was within vendor specifications for trip force until May 8, 2012, a period of 42 days after the March 27, 2012 failure. Due

to the inadequate troubleshooting, the underlying problems with the trip latch mechanism were not identified and corrected.

Analysis. The inspectors determined that the failure to take prompt and effective corrective action following identification of a condition adverse to quality with the trip latch mechanism was a performance deficiency that was reasonably within Dominion's ability to foresee and prevent.

The inspectors determined that this issue was more than minor because it is similar to the more than minor example 4.f of IMC 0612, Appendix E, "Examples of Minor Issues." Specifically, Dominion failed to correct a condition adverse to quality that affected the operability of the TDAFW pump. Additionally, the finding was more than minor because it is associated with the Equipment Performance attribute of the Mitigating Systems cornerstone, and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, a condition adverse to quality with the trip latch mechanism was not properly evaluated, not effectively corrected, and resulted in a situation that impacted the reliability of the component.

In accordance with NRC Inspection Manual Chapter 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," a Phase 1 SDP screening was performed and determined the finding was of very low safety significance (Green) because the finding does not represent a loss of system and/or function, does not represent an actual loss of function of at least a single train for greater than its technical specification allowed outage time or two separate safety systems out-of-service for greater than its technical specification allowed outage time, and does not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's Maintenance Rule program for greater than 24 hrs.

The inspectors determined that this finding had a cross-cutting aspect in the Problem Identification and Resolution cross-cutting area, Corrective Action Program component, because Dominion did not thoroughly evaluate the problem such that the resolution addressed the causes [P.1(c)]. Specifically, Dominion's causal evaluation did not provide for prompt and effective resolution of the degraded trip latch.

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected. Contrary to the above, from November 17, 2011, to May 8, 2012, Dominion did not take prompt and effective corrective actions to identify and resolve the degraded condition of the TDAFW pump trip latch mechanism prior to the condition adversely impacting reliability of the component. Dominion prepared CR483676 to assess the cause and corrective actions for ACE 019090. Because of the very low safety significance (Green) and because it has been entered into Dominion's CAP (CR483676), the NRC is treating this finding as an NCV, consistent with the NRC's Enforcement Policy. **(NCV 05000423/2012010-02, Failure to Take Prompt and Effective Corrective Actions to Address TDAFW Pump Trip Latch Mechanism Degradation)**

.2 Assessment of the Use of Operating Experience

a. Inspection Scope

The inspectors reviewed a sample of condition reports associated with the review of industry operating experience to determine whether Dominion appropriately evaluated the operating experience information for applicability to Millstone Power Station and had taken appropriate actions, when warranted. The inspectors also reviewed evaluations of operating experience documents associated with a sample of NRC generic communications to ensure that Dominion adequately considered the underlying problems associated with the issues for resolution via their corrective action program. In addition, the inspectors observed various plant activities to determine if the station considered industry operating experience during the performance of routine and infrequently performed activities.

b. Assessment

The inspectors determined that Dominion appropriately considered industry operating experience information for applicability, and used the information for corrective and preventive actions to identify and prevent similar issues when appropriate. The inspectors determined that operating experience was appropriately applied and lessons learned were communicated and incorporated into plant operations and procedures when applicable. The inspectors also observed that industry operating experience was routinely discussed and considered during the conduct of CRT meetings.

c. Findings

No findings were identified.

.3 Assessment of Self-Assessments and Audits

a. Inspection Scope

The inspectors reviewed a sample of audits, including the most recent audit of the corrective action program, departmental self-assessments, and assessments performed by independent organizations. Inspectors performed these reviews to determine if Dominion entered problems identified through these assessments into the corrective action program, when appropriate, and whether Dominion initiated corrective actions to address identified deficiencies. The inspectors evaluated the effectiveness of the audits and assessments by comparing audit and assessment results against self-revealing and NRC-identified observations made during the inspection.

b. Assessment

The inspectors concluded that self-assessments, audits, and other internal Dominion assessments were generally critical, thorough, and effective in identifying issues. The inspectors observed that Dominion personnel knowledgeable in the subject completed these audits and self-assessments in a methodical manner. Dominion completed these audits and self-assessments to a sufficient depth to identify issues which were then entered into the corrective action program for evaluation. In general, the station implemented corrective actions associated with the identified issues commensurate with

their safety significance. However, the inspectors identified one example of more than minor significance where Dominion personnel failed to perform procedurally required effectiveness reviews for numerous formal self assessments. This finding is documented in Section 4OA2.3.c.

c. Findings

Introduction. The inspectors identified a finding (FIN) of very low safety significance (Green) for Dominion's failure to perform procedurally required effectiveness reviews for numerous formal self-assessments. Consequently, Dominion missed opportunities to identify potential corrective actions for resolution in the corrective action program.

Description: The inspectors performed a review of Dominion self-assessments completed since the last PI&R inspection in February 2010. Dominion self-assessments include both formal and informal self-assessments. Formal self-assessments are performed to ensure the level of performance is equal to industry experience and best practices, and typically are conducted by a diverse, multimember team of site employees and industry peers. Informal self-assessments are short duration, rapid turnaround activities designed to review a program or process.

The inspectors performed a review of procedures that detail the requirements for formal self-assessments. Specifically, the inspectors reviewed Dominion procedure PI-AA-100-1004, "Self-Assessments," Revision 8. Step 3.5.2 of the procedure states that if a formal self-assessment is being performed, then an effectiveness review of the results of the assessment shall be created. The inspectors reviewed a list of approximately 230 formal and informal self-assessments, and sampled 14 formal self-assessments for a detailed inspection. The inspectors found that six formal self-assessments did not include the procedurally required effectiveness review. These formal self-assessments reports (SAR) were:

- SAR001048, "Procedure Use and Adherence"
- SAR001067, "VPP to Include Employee Involvement and Slips/Trips/Falls"
- SAR001473, "Processing of Protective Services"
- SAR001542, "Fleet Job-Hazard Control Assessment in Support of 2015 Business Plan"
- SAR001723, "Maintenance Outage Preparations"
- SAR001782, "2012 Millstone PI&R Inspection Readiness."

Team leaders from the departments of operations, safety, security, maintenance, and organizational effectiveness had failed to ensure that an effectiveness review was completed for the self-assessment they had led. Further inspection of the issue revealed that multiple programmatic barriers had failed to ensure that the effectiveness reviews would be completed. This included insufficient training of team leaders, a failure to perform planning checklists which assign the effectiveness review to the team leader, and a failure of the self-assessment program oversight to discover the missing effectiveness review during a final review of the self assessment. Due to the failure of numerous barriers in the program, the inspectors determined that this represented a programmatic weakness in the station's ability to ensure that formal self-assessments and their effectiveness reviews are completed in accordance with procedural requirements.

Analysis. The inspectors determined that Dominion's failure to consistently implement procedural requirements with respect to performing effectiveness reviews for formal self-assessments was a performance deficiency that was within Dominion's ability to foresee and correct and should have been prevented.

This finding is more than minor because it is similar to IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," example 3.j; in that, it represents a programmatic deficiency that could lead to worse errors if uncorrected. The inspectors determined it was a programmatic deficiency because multiple programmatic barriers had failed to ensure the effectiveness reviews would be completed. The inspectors determined that the issue could have the potential to lead to worse errors if left uncorrected because not following an established process for performing effectiveness reviews could lead to ineffective corrective actions that go undetected. This finding was evaluated in accordance with NRC IMC 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," and determined to be of very low safety significance (Green) because the finding does not represent a loss of system and/or function, does not represent an actual loss of function of at least a single train for greater than its technical specification allowed outage time or two separate safety systems out-of-service for greater than its technical specification allowed outage time, and does not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's Maintenance Rule program for greater than 24 hrs. The inspectors determined that this finding is not associated with an NRC Reactor Oversight Process cornerstone.

The inspectors determined that this finding had a cross-cutting aspect in the Human Performance cross-cutting area, Work Practices component, because Dominion personnel failed to follow procedures. [H.4(b)].

Enforcement. This finding does not involve enforcement action since no regulatory requirement violation was identified because Dominion procedure PI-AA-100-1004 is not required to be implemented as part of the Dominion's 10 CFR 50 Appendix B Quality Assurance Program. Dominion has entered the issue into the corrective action program (CR482135). Because this finding does not involve a violation, it is identified as a finding (FIN). **FIN 05000336&423/2012010-03, Failure to Perform Effectiveness Reviews for Formal Self-Assessments.**

.4 Assessment of Safety Conscious Work Environment

a. Inspection Scope

During interviews with station personnel, the inspectors assessed the safety conscious work environment at Millstone Power Station. Specifically, the inspectors interviewed personnel to determine whether they were hesitant to raise safety concerns to their management and/or the NRC. The inspectors also interviewed the station Employee Concerns Program coordinator to determine what actions are implemented to ensure employees were aware of the program and its availability with regards to raising safety concerns. The inspectors reviewed the Employee Concerns Program files to ensure that Dominion entered issues into the corrective action program, when appropriate.

b. Assessment

During interviews, Dominion staff expressed a willingness to use the corrective action program to identify plant issues and deficiencies and stated that they were willing to raise safety issues. The inspectors noted that no one interviewed stated that they personally experienced or were aware of a situation in which an individual had been retaliated against for raising a safety issue. All persons interviewed demonstrated an adequate knowledge of the corrective action program and the Employee Concerns Program. Based on these limited interviews, the inspectors concluded that there was no evidence of an unacceptable safety conscious work environment and no significant challenges to the free flow of information.

c. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On Thursday, August 2, 2012, the inspectors presented the inspection results to Mr. Stephen Scace, Site Vice President, and other members of the Millstone Power Station staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

ATTACHMENT: SUPPLEMENTARY INFORMATION

## SUPPLEMENTARY INFORMATION

### KEY POINTS OF CONTACT

Licensee Personnel

P. Anastas - Nuclear Engineer III ENGR - Nuclear Engineering Programs
D. Bajumpaa - Consulting Engineer - Nuclear Safety Analysis
D. Cleary - System Engineering Supervisor
J. (W.) Cote - Senior Instructor, Unit 3
G. D'auria - Nuclear Chemistry Supervisor
P. Dellarco - Coordinator Nuclear Procedures
T. Fecteau - Design Engineer
B. Ferguson - Shift Manger (Unit 2)
C. Flory - Nuclear Technical Specialist III
K. Grover - Manager Nuclear Operations
S. Hanerfeld - Corrective Action Program Manager
M. Hess - Nuclear Engineer III
S. Matthess - Nuclear Chemistry Supervisor
J. Paris - System Engineer
D. Regan - Radiation Protection Supervisor
L. Salyards - Licensing Specialist
J. Shaffer - Sr. Nuclear Chemistry Technician
D. Smith - Emergency Preparedness Manager
E. Smith - System Engineer
R. Smith - Procedures Group Manager
S. Smith - Manager, Nuclear Engineering
R. Steenbergen - Nuclear Engineer III
H. Williamson - Shift Manager (Unit 2)

### LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened and Closed

| | | |
|---|---|---|
| 05000423/2012010-01 | NCV | Failure to Take Timely Corrective Actions to Restore Degraded Unit 3 Main Feedwater Isolation Valves |
| 05000423/2012010-02 | NCV | Failure to Take Prompt and Effective Corrective Actions to Address TDAFW Pump Trip Latch Mechanism Degradation |
| 05000336&423/2012010-03 | FIN | Failure to Perform Effectiveness Reviews for Formal Self-Assessments |

## LIST OF DOCUMENTS REVIEWED

### Section 4OA2: Problem Identification and Resolution

Audits and Self-Assessments

Nuclear Oversight Audit 12-02: Emergency Preparedness, April 20, 2012
SAR000934, Drill and Exercise Corrective Action Effectiveness
SAR000402, Operating Experience Program
SAR001071, Maintenance Rule Evaluation Assessment
SAR001235, ERO Activation Including On Shift Staffing and Staff Augmentation
SAR001422, Formal Self-Assessment of the Millstone Maintenance Rule Program
SAR001868, Assessment of Maintenance Rework
SAR001051, Human Performance in RP
SAR001048, Procedure Use and Adherence
SAR001425, Communications in RP
Nuclear Oversight Audit 10-01, Security/FFD/UAA
Nuclear Oversight Audit 12-01, FFD and UAA Audit Report
Nuclear Oversight Audit 11-05, Corrective Action and Independent Review
SAR001599, Millstone Power Station 2011 Mid-Cycle Assessment
SAR001048, Procedure Use and Adherence
SAR001067, VPP to Include Employee Involvement and Slips/Trips and Falls
SAR001473, Millstone Formal Self-Assessment on Processing of Protection Services Information
SAR001517, Training Programs
SAR001542, Safety – Fleet Job Hazard
SAR001571, Simulator Fidelity
SAR001709, ISI Program
SAR001723, Maintenance Outage Preparations
SAR001782, Millstone PI&R Self Assessment
SAR001794, Assessment of the Implementation of the MPS Corrective Action Program
SAR001868, Maintenance Rework
ITC-SA-04-23, Operating Experience Program Self Assessment

Condition Reports and Corrective Action Items *(* indicates that condition report was generated as a result of this inspection)*

| | | | | |
|---|---|---|---|---|
| 08-00406 | 356077 | 374866 | 387035 | 397934 |
| 08-03194 | 363704 | 374912 | 387858 | 399101 |
| 07-07160 | 365613 | 374913 | 388630 | 400037 |
| 325532 | 365353 | 375566 | 388767 | 400167 |
| 333435 | 365613 | 375997 | 389364 | 401142 |
| 341621 | 365628 | 377624 | 393925 | 401995 |
| 342874 | 366382 | 380942 | 394563 | 403963 |
| 343031 | 370991 | 384221 | 394678 | 405337 |
| 354059 | 372053 | 386142 | 395026 | 406328 |
| 355434 | 372130 | 386654 | 396012 | 406661 |
| 355646 | 372131 | 386769 | 396251 | 412791 |

| | | | | |
|---|---|---|---|---|
| 414195 | 121147 | 190775 | 228911 | 467115 |
| 415782 | 420485 | 190776 | 189913 | 467817 |
| 418746 | 217790 | 190777 | 200895 | 471758 |
| 425970 | 480749 | 190778 | 206034 | 472328 |
| 426589 | 379359 | 190779 | 210873 | 473596 |
| 426592 | 167826 | 190780 | 214971 | 476136 |
| 429521 | 186371 | 190781 | 209829 | 476206 |
| 429578 | 405407 | 467858 | 222336 | 477107 |
| 430366 | 186359 | 230563 | 224310 | 478020 |
| 431576 | 405419 | 230564 | 440547 | 478857 |
| 431831 | 460090 | 233769 | 449697 | 478888 |
| 433674 | 464209 | 235919 | 449680 | 479294 |
| 434032 | 228071 | 235920 | 449650 | 479373 |
| 435027 | 229850 | 235924 | 175765 | 479541 |
| 436518 | 229851 | 235921 | 189913 | 479760 |
| 436521 | 467115 | 367763 | 195438 | 480363 |
| 436675 | 230220 | 159654 | 200895 | 480766 |
| 437445 | 230222 | 367746 | 206034 | 481401 |
| 437907 | 127389 | 159654 | 209829 | 481694 |
| 441302 | 127390 | 367995 | 210873 | 481850 |
| 444344 | 127388 | 190782 | 214971 | 481939 |
| 444912 | 127391 | 190783 | 217744 | 482264 |
| 446342 | 127392 | 190784 | 222336 | 482274 |
| 455506 | 134673 | 190785 | 224310 | 482536 |
| 458424 | 332133 | 190786 | 225275 | 483477 |
| 460177 | 236892 | 420485 | 228911 | 483676 |
| 462222 | 134673 | 440547 | 229579 | 483938 |
| 463020 | 390239 | 464453 | 229863 | 483048 |
| 464019 | 476936 | 454945 | 229871 | 483315 |
| 465420 | 239689 | 452067 | 229875 | 483477 |
| 465969 | 480561 | 442926 | 110811 | 483637 |
| 468089 | 377802 | 368451 | 316335 | 483826 |
| 466825 | 376651 | 368524 | 324298 | 483315* |
| 472422 | 165879 | 371414 | 355314 | 481975* |
| 472476 | 169454 | 372066 | 363297 | 481939* |
| 473329 | 169456 | 377068 | 367704 | 483592* |
| 478889 | 169457 | 381656 | 403794 | 483572* |
| 481466 | 169460 | 385154 | 407906 | 482264* |
| 405103 | 342087 | 397152 | 409403 | 482548* |
| 392490 | 389134 | 448098 | 419723 | 482184* |
| 185980 | 208029 | 461896 | 437419 | 483477* |
| 472328 | 208030 | 465645 | 445228 | 482115* |
| 235230 | 208031 | 195438 | 447218 | 482264* |
| 233510 | 400084 | 217744 | 453213 | 482184* |
| 476136 | 397038 | 450150 | 457341 | 482135* |
| 476206 | 000635 | 229875 | 459821 | 483401* |
| 473596 | 000636 | 229863 | 463624 | |
| 188954 | 000637 | 229871 | 464209 | |
| 410348 | 000638 | 229579 | 464340 | |
| 194088 | 188623 | 175765 | 464939 | |
| 194090 | 190774 | 225275 | 467114 | |

Drawings

25203-30024, Millstone Unit 2 Single Line Diagram 125VDC Emergency & 120VAC Vital Systems, Revision 32
25203-26131 SH.3 - Millstone Nuclear Power Station - Unit 2 Appendix R Boundary & Component Diagram Service Water Waterford, CT

Operating Experience

IN 2010-20, Turbine-Driven Auxiliary Feedwater Pump Repetitive Failures
IN 97-78, Crediting of Operator Actions in Place of Automatic Actions and Modifications of Operator Actions, Including Response Times
OPEX002906, IN 2011-04, Affecting Stress Corrosion Cracking in Stainless Steel Piping in Pressurized Water Reactors
CR464453
CR454945
CA221002
CR452067
CA219002
CR442926
CR367259
CA224822

NCVs and Findings

05000336/2011004-01, Failure to Electrically Isolate a Unit 2 Dissimilar Metal Flanged Joint Leads to Forced Shutdown Due to Service Water Leak
0500336/2011003-02, Untimely Corrective Action for Unit 2 Safety Related Inverters Leads to Repetitive Out of Calibration Results
05000305/2008008(DRS), Post-fire Shutdown Procedures Failed to Ensure Time-Critical Operator Actions were Performed in an Expeditious Manner
05000336/2010003, Unit 3 Charging Pump Overheating and Cavitation during RCS Loop Vacuum Fill
0500336/2011003, Inadequate Corrective Action Results in Loss of Unit 2 Enclosure Building's Safety Function

Procedures

C MP 715E, General Practices for Flanges and Threaded Fasteners, Revision 1-02
CM-AA-DDC-301, Post Design Change Testing, Revision 2
CM-AA-REA-1001, Request for Engineering Assistance, Revision 1
DNES-AA-GN-1003, Design Effects and Considerations, Revision 10
ER-AA-5004, Long Range Planning, Revision 2
ER-AA-MRL-10, Maintenance Rule Program, Revision 4
ER-AA-MRL-100, Implementing Maintenance Rule, Revision 5
MP-24-ENG-FAP947, Non-Code Repairs in Safety Class 3 Piping, Revision 1-05
OP 2346A, 'A' Emergency Diesel Generator, Revision 27-13
OP-AA-102-1001, Development of Technical Basis to Support Operability Determinations, Revision 6
PI-AA-100-1004, Self Assessments, Revision 8
PI-AA-100-1007, Operating Experience Program, Revision 9

PI-AA-200, Corrective Action, Revision 19
PI-AA-200-2002, Effectiveness Reviews, Revision 4
PI-AA-300-3001, Root Cause Evaluation, Revision 3
PI-AA-300-3002, Apparent Cause Evaluation, Revision 4
PI-AA-300-3003, Common Cause Evaluation, Revision 0
PT 21415A, MP2 Inverters 1-4 Tests, Revision 4-04
SP 2613K, Diesel Generator Slow Start Operability Test, Facility 1, Revision 5
SP 2613L, Diesel Generator Slow Start Operability Test, Facility 2, Revision 5-02
OA8, Housekeeping of Station Buildings, Facilities, Equipment, and Grounds, Revision 007-04
AOP 2560, Millstone Unit 2 Storms, High Winds and High Tides, Revision 010-08
RP-AA-502, Ground Water Protection Program, Revision 4
CM-AA-TCA-101, Operator Time Critical Actions, Revision 0
C OP 200.18, Time Critical Action Validation and Verification, Revision 000-01
ER-AA-MRL-100, Implementing Maintenance Rule, Revision 5
PI-AA-100-1007, Operating Experience, Revision 9
DNAP-0110, Identifying and Addressing Nuclear Safety and Quality Concerns, Revision 2
RPM 2.4.3, DOP Testing of Portable HEPA Filtered Ventilation and Vacuum Units, Revision 005-01
CM-AA-TCA-101, Time Critical Operator Actions, Revision 0
C OP 200.18, Time Critical Action Validation and Verification, Revision 000-01
MP-05-DC-FAP01.1, Developing and Modifying Procedures, Revision 011-01
OP-AA-102-1001, Development of Technical Basis to Support Operability Determinations, Revision 6

Work Orders

53102399850, 53102300585, 53102428448, 53102428439, 53102439805, 53102266363, 53102389487, 53102446088, 53102457030, 53102468347, 53102468350, 53102468351, 53102468352, 53102512103, 53102512109, 53102513353

Miscellaneous

A1E000129, SENG – ASMT, perform an a(1) Evaluation for identified MP3 systems
DM2-00-0145-09, Installation of F3D/E/F Blower Cooling Inlet Air Filters and Air Discharge Piping Material Upgrades, 7/13/09
DM2-01-0145-09, Instrument Air Compressor Discharge Check Valve Flange Face Modification, 10/19/09
DM2-02-0145-09, F3D, F3E and F3F Discharge Air Piping Modification and Check Valve Model Number Change, 12/8/09
DM2-05-0145-09, F3D Discharge Air Piping Minor Configuration Change, 7/22/10
DM2-06-0145-09, F3D Check Valve 2-IA-975 Model Change, 10/19/10
DM2-S-0213-94, Vital Inverter Synchronizing Limit Set Point Change, 4/14/94
ENG-04349E2, MP Static Transfer Switches VS1, VS2, VS3, and VS4 Synchronizing Limit Setpoint, Revision 0
ETE-CEP-2012-1001 – Galvanic Corrosion Mitigation for Dissimilar Metal Joints in Sea Water Service, Revision 0
ETE-MP-2011-0104, MP2 Inverter Synchronization, Revision 0
Millstone Emergency Preparedness DSEM Meeting Summary, Monthly Meeting for 5/26/2012-6/25/2012
MP-10-026, Revision 40 to the Millstone Emergency Plan – Supplemental Review Covering Changes not Addressed in 50.54q MP-10-015

MP2-12-01027, 120VAC Vital Inverter Synchronizing Limit Setpoint Change, Revision 0
MP2 Vital Inverters, System 2345B, 2007 Quarterly System Health Reports
MP2 Vital Inverters, System 2345B, 2008 Quarterly System Health Reports
MP2 Vital Inverters, System 2345B, 2009 Quarterly System Health Reports
MP2 Vital Inverters, System 2345B, 2010 Quarterly System Health Reports
MP2 Vital Inverters, System 2345B, 2011 Quarterly System Health Reports
MP2 Vital Inverters, System 2345B, 2012 1st Quarter System Health Report
MRE012128, SENG MRE, 3MSS-P47A and 3MSS-P47C show evidence of thermal binding between plug and cage
MRE012940, Site Eng MRE, Security notification of water tight door between EDG rooms found open
MRE013911, SENG Unit 2 Reactor Trip
MRE01480, SENG MRE, EEQ qualification of Main Steam transmitters is in question
MRE014220, SENG – MRE, 2-SW-178C, SW to X183m upper SWGR room failed surveillance SP 2612D-002
MRE014159, SENG – SW spool leak required an unplanned shutdown IAW TSAS 3.7.4.1 and TRM 3.4.10
NEI 07-07, Ground Water Protection Program, August 2007
12-10-M, Nuclear Oversight Assessment - Time Critical Operator Actions, March 2012
ACE014108, AOP 2579B Validation does not support 30 min requirement for AFW initiation
MRE012051, Site Engr- 'B' CHS pp stopped after exhibtiing indications of cavitation
ACE18173, "B" Charging Pump stopped after exhibiting indications of cavitation
RCE001037, Millstone Unit 2 Reactor Trip on 11/28/2010
MRE012949, Power Range B Bistable indication is inconsistent with other channels
ACE19015, Three SI valve found out of position
ACE 19151, Unit 3 "B" EDG Inability to Load to 110%
ACE018137, Worker entered a Locked High Radiation Area on the Incorrect RWP
ACE018276, Chemistry - Tritium in Water Found in Electrical Manhole 3EMH-3A (LTCA)
RCE001032, Free Available Chlorine NPDES Exceedance at Sample Point DSN001C-5
EFR000334, RCE 001032 OR/CA EFR - Unit 3 NPDES exceedance for Service Water
ACE19089, Unable to reset TDAFW governor speed setting to required 19.8-20 per SP 3622.3
MRE014949, SENG - MRE, Unable to reset TDAFW governor speed setting to required
ACE19094, Unable to reset TDAFW governor speed setting to required 19.8-20 per SP 3622.3
25203-SP-M2-SU-1046, Unit 2 Appendix R Compliance Report
DM2-00-0152-11, Compliance Report revision Due to LBDCR 11-M2-005
SO-09-007, Standing Order: RWP Briefing Expectations & Verification for HRA, LHRA, and VHRA entries
MP3-11-01143, Design Change: Addition of Domestic Water low Pressure Shutoff to Hypochlorite Pumps
Millstone CAP Workflow Extension Policy, Effective 04/02/2012
Millstone Power Station KPIs for CARB Review, April 2012
Corrective Action Program Trend Report, 1st Quarter 2012
ACE019090, TDAFW trip valve failed to trip (repeat)
ACE019185, 3HVC*FN1B wiring error
RCE001075, Unit 3 Entered TS 3.0.3 for all main steam line pressure transmitters inoperable
OD000237 (MP3-014-07), “MP3 Feedwater isolation trip valves – 3FWS*CTV41A, B, C and D,” Revision 1 and Revision 2
OD MP3-014-07, “3FWS*CTV41’s Closing Capability Against Main Feedwater Shutoff Pressure is Non-Conforming to Current Industry Requirements,” Dated August 21, 2007
Memo MP3-DE-96-467, “MP3-Feedwater Overpressurization, DCR M3-96060,” dated June 13, 1996

MEMO-NSA-20120002, Millstone 3 Steam Generator Tube Rupture (SGTR) Margin to Overfill (MTO) Critical Operator Action Times, dated May 21, 2012
Email from w. Loweth to R. Burnham dated March 6, 2008
MP 3760DB, “SG FWIV – Hydraulic Fluid and N2 Levels,” Revision 008-03
MRE014537, SENG-MRE 3MSS*MSV5 trip throttle valve, the valve did not trip
MRE014540, SENG MRE U3 Turbine Driven AFW Pump Failed Manual Trip
MRE014952, SENG-MRE 3MSS*MSV5 would not trip when manual overspeed device was actuated
Plant Health Issues List dated July 24, 2012
AR09000291, Recommend setpoint, design and procedure changes for MSVB ventilation system, Dated February 23, 2009
AR070003963, Hydraulic Control Units Design Thrust Capabilities, Dated March 10, 20111
EPRI TR-103232, EPRI MOV Performance Prediction Program, Dated November 1994
NRC IN 97-78, Crediting of Operator Actions in Place of Automatic Action and Modifications of Operator Actions, Including response Times
NRC IN 2012-03, Design Vulnerability in Electric Power System
NRC IN 2012-14, Containment Concrete Surface Condition Examination Frequency and Acceptance Criteria
NRC Part 21 Report 2012-12-00, Rosemount Transmitters Certain Rosemount Model 1154 Series H Pressure Transmitters
NRC Memo from John Hannon to Sunnil Weerakkody, Subject: Resolution of Questions Concerning Compliance with Section III.L.2 of Appendix R, Dated February 10, 2005
RAS 000176, Justification for TCOA to Secure RCPs, dated April 4, 2011
SAA013218, The M2H7BD Unit 2 ‘B’ Emergency Diesel Generator became unresponsive during a maintenance run resulting in a delay of restoration in excess of 48 hours
SA001038, Informal SA - Effectiveness of Design Change Process Failure Modes and Effects
SA001314, Fleet Post Modification Testing Effectiveness
SA001160, Flow Accelerated Corrosion Program Health Report Adequacy
SA001581, Maintenance Procedure Quality
SA010557, NON-SA Engineering Fleet Effectiveness Reviews – CM 39, Operator Time Critical Actions
Nuclear Oversight Assessment No. 12-10-M, Time Critical Operator Actions, Dated March 14, 2012
Nuclear Oversight Department Quarterly Report Millstone Power Station, Fourth Quarter 2011
Fleet Initiative Effectiveness Review CM-39, Fleet Time Critical Operator Actions, dated March 22, 2012

## LIST OF ACRONYMS

| | |
|---|---|
| ACE | Apparent Cause Evaluation |
| ADAMS | Agency-wide Documents Access and Management System |
| AOP | Abnormal Operating Procedure |
| CA | Corrective Action |
| CAART | Corrective Action Assignment Review Team |
| CAP | Corrective Action Program |
| CFR | Code of Federal Regulations |
| CR | Condition Report |
| CRT | Condition Report Review Team |
| DRP | Division of Reactor Projects |
| DRS | Division of Reactor Safety |
| EPRI | Electric Power Research Institute |
| ESF | Emergency Safeguards Feature |
| FIN | Finding |
| IMC | Inspection Manual Chapter |
| IOD | Immediate Operability Determination |
| LTCA | Long Term Corrective Action |
| NCV | Non-Cited Violation |
| NRC | Nuclear Regulatory Commission |
| OA | Other Activities |
| PARS | Publicly Available Records System |
| RCE | Root Cause Evaluation |
| RFO | Refueling Outage |
| SAR | Self Assessment Report |
| SDP | Significance Determination Process |
| SGTR | Steam Generator Tube Rupture |
| TCOA | Time Critical Operator Action |
| TDAFW | Turbine Driven Auxiliary Feedwater |
| UFSAR | Updated Final Safety Analysis Report |

**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
**REGION I**
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

September 4, 2012

Mr. David Heacock
Sr. Vice President and Chief Nuclear Officer
Dominion Resources
500 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MID-CYCLE PERFORMANCE REVIEW AND INSPECTION PLAN - MILLSTONE POWER STATION UNIT 2 AND UNIT 3 (REPORT 05000336/2012006 and 05000423/2012006)

Dear Mr. Heacock:

On August 14, 2012, the U. S. Nuclear Regulatory Commission (NRC) completed its mid-cycle performance review of Millstone Power Station Unit 2 and Unit 3. The NRC reviewed the most recent quarterly performance indicators (PIs) in addition to inspection results and enforcement actions from July 1, 2011, through June 30, 2012. This letter informs you of the NRC's assessment of your facility during this period and its plans for future inspections at your facility. This assessment reflects the integration of the Security Cornerstone into the Reactor Oversight Process (ROP) performance assessment program governed by Inspection Manual Chapter (IMC) 0305, "Operating Reactor Assessment Program."

The NRC determined the performance at Millstone Power Station Unit 2 during the most recent quarter was within the Regulatory Response Column of the NRC's ROP Action Matrix based on one finding assigned to the second quarter of 2011 having low to moderate safety significance (White) in the Initiating Events Cornerstone. This finding involved the failure of Unit 2 Millstone personnel to carry out their assigned roles and responsibilities and inadequate reactivity management during main turbine valve testing, which contributed to an unintended eight percent reactor power transient (88 percent to 96 percent) on February 12, 2011.

As a result of our review of Millstone Power Station Unit 2 performance, we plan to conduct a supplemental inspection using NRC Inspection Procedure 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area," in September 2012. This inspection procedure is conducted to provide assurance that the root cause and contributing causes of risk significant performance issues are understood, the extent of condition is identified, and the corrective actions are sufficient to prevent recurrence.

The NRC determined the performance at Millstone Power Station Unit 3 during the most recent quarter was within the Licensee Response Column of the NRC's Reactor Oversight Process (ROP) Action Matrix because all inspection findings had very low (i.e., green) safety significance, and all PIs indicated that your performance was within the nominal, expected range (i.e., green). Therefore, the NRC plans to conduct ROP baseline inspections at Unit 3.

The enclosed inspection plan lists the inspections scheduled through December 31, 2013. Routine inspections performed by resident inspectors are not included in the inspection plan.

In addition to the baseline inspections, consistent with the Agency's actions related to Fukushima, the NRC will perform TI-187, "Inspection of Near-Term Task Force Recommendation 2.3 Flooding Walkdowns," and TI-188, "Inspection of Near-Term Task Force Recommendation 2.3 Seismic Walkdowns." The inspections listed during the last nine months of the inspection plan are tentative and may be revised at the end-of-cycle performance review. The NRC provides the inspection plan to allow for the resolution of any scheduling conflicts and personnel availability issues. The NRC will contact you as soon as possible to discuss changes to the inspection plan should circumstances warrant any changes. This inspection plan does not include security related inspections, which will be sent via separate, non-publicly available correspondence.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Document Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Please contact Dr. Ronald R. Bellamy at (610) 337-5200 with any questions you have regarding this letter.

Sincerely,

/***RA***/

Darrell J. Roberts, Director
Division of Reactor Projects

Docket Nos.: 50-336, 50-423
License Nos.: DPR-65, NPF-49

Enclosure: Millstone Inspection/Activity Plan

cc w/encl: Distribution via ListServ

In addition to the baseline inspections, consistent with the Agency's actions related to Fukushima, the NRC will perform TI-187, "Inspection of Near-Term Task Force Recommendation 2.3 Flooding Walkdowns" and TI-188 "Inspection of Near-Term Task Force Recommendation 2.3 Seismic Walkdowns." The inspections listed during the last nine months of the inspection plan are tentative and may be revised at the end-of-cycle performance review. The NRC provides the inspection plan to allow for the resolution of any scheduling conflicts and personnel availability issues. The NRC will contact you as soon as possible to discuss changes to the inspection plan should circumstances warrant any changes. This inspection plan does not include security related inspections, which will be sent via separate, non-publicly available correspondence.

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Sincerely,
/***RA***/
Darrell J. Roberts, Director
Division of Reactor Projects

Docket Nos.: 50-336, 50-423
License Nos.: DPR-65, NPF-49

Enclosure: Millstone Inspection/Activity Plan

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| ☑ SUNSI Review | | ☑ Non-Sensitive<br>☐ Sensitive | | ☑ Publicly Available<br>☐ Non-Publicly Available | |
|---|---|---|---|---|---|
| OFFICE | RI/DRP | RI/DRP | RI/DRP | | |
| NAME | TSetzer | RBellamy | DRoberts | | |
| DATE | 08/28/12 | 08/29/12 | 08/30/12 | | |

OFFICIAL RECORD COPY

# Millstone
## Inspection / Activity Plan
## 07/01/2012 - 12/31/2013

| Unit Number | Planned Dates Start | End | Inspection Activity | Title | No. of Staff on Site |
|---|---|---|---|---|---|
| | | | **EP** | **- EP ANNUAL REPORT** | **4** |
| 2, 3 | 06/30/2012 | 12/31/2012 | IP 7111406 | Drill Evaluation | |
| | | | **EP EX** | **- EP EXERCISE EVALUATION** | **9** |
| 2, 3 | 06/21/2012 | 08/28/2012 | IP 7111401 | Exercise Evaluation | |
| 2, 3 | 08/19/2012 | 08/24/2012 | IP 71151 | Performance Indicator Verification | |
| | | | **71152B** | **- PI&R** | **4** |
| 2, 3 | 07/16/2012 | 07/20/2012 | IP 71152B | Problem Identification and Resolution | |
| 2 | 07/30/2012 | 08/03/2012 | IP 71152B | Problem Identification and Resolution | |
| | | | **TI 182** | **- DEGRADATION OF UNDERGROUND PIPING** | **1** |
| 2, 3 | 07/09/2012 | 07/13/2012 | IP 2515/182 | Review of the Implementation of the Industry Initiative to Control Degradation of Underground Piping | |
| | | | **71124** | **- RADWASTE** | **1** |
| 2, 3 | 07/23/2012 | 07/27/2012 | IP 71124.08 | Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation | |
| | | | **7111111B** | **- MS2 ON-SITE REQUAL INSP W/ P/F RESULTS** | **2** |
| 2 | 09/17/2012 | 09/21/2012 | IP 7111111B | Licensed Operator Requalification Program | |
| | | | **71152** | **- PIR SAMPLE MILLSTONE COMMITMENT FOLLOWUP** | **1** |
| 2, 3 | 07/30/2012 | 08/03/2012 | IP 71152 | Problem Identification and Resolution | |
| | | | **2515/188** | **- SEISMIC WALKDOWNS** | **3** |
| 2, 3 | 08/06/2012 | 08/10/2012 | IP 2515/188 | Inspection of Near-Term Task Force Recommendation 2.3 Seismic Walkdowns | |
| | | | **2515/187** | **- FLOODING WALKDOWNS** | **3** |
| 2, 3 | 08/20/2012 | 08/24/2012 | IP 2515/187 | Inspection of Near-Term Task Force Recommendation 2.3 Flooding Walkdowns | |
| | | | **95001** | **- 95001 SUPPLEMENTAL INSPECTION** | **2** |
| 2 | 09/17/2012 | 09/21/2012 | IP 95001 | Supplemental Inspection for One or Two White Inputs in a Strategic Performance Area | |
| | | | **71124** | **- OCC RADIATION SAFETY** | **1** |
| 2, 3 | 10/15/2012 | 10/19/2012 | IP 71124.01 | Radiological Hazard Assessment and Exposure Controls | |
| 2, 3 | 10/15/2012 | 10/19/2012 | IP 71124.02 | Occupational ALARA Planning and Controls | |
| 2, 3 | 10/15/2012 | 10/19/2012 | IP 71124.03 | In-Plant Airborne Radioactivity Control and Mitigation | |
| 2, 3 | 10/15/2012 | 10/19/2012 | IP 71124.04 | Occupational Dose Assessment | |
| | | | **7111108P** | **- UNIT 2 INSERVICE INSPECTION** | **1** |
| 2 | 10/15/2012 | 10/26/2012 | IP 7111108P | Inservice Inspection Activities - PWR | |
| | | | **71124** | **- OCC RAD SAFETY** | **1** |
| 2, 3 | 12/10/2012 | 12/14/2012 | IP 71124.01 | Radiological Hazard Assessment and Exposure Controls | |
| 2, 3 | 12/10/2012 | 12/14/2012 | IP 71124.02 | Occupational ALARA Planning and Controls | |
| 2, 3 | 12/10/2012 | 12/14/2012 | IP 71124.03 | In-Plant Airborne Radioactivity Control and Mitigation | |

This report does not include INPO and OUTAGE activities.
This report shows only on-site and announced inspection procedures.

# Millstone
## Inspection / Activity Plan
## 07/01/2012 - 12/31/2013

| Unit Number | Planned Dates Start | Planned Dates End | Inspection Activity | Title | No. of Staff on Site |
|---|---|---|---|---|---|
| | | | **71124** | **- OCC RAD SAFETY** | **1** |
| 2, 3 | 12/10/2012 | 12/14/2012 | IP 71124.04 | Occupational Dose Assessment | |
| | | | **71124** | **- HP INSTRUMENTATION** | **1** |
| 2, 3 | 12/17/2012 | 12/21/2012 | IP 71124.05 | Radiation Monitoring Instrumentation | |
| | | | **EP** | **- EP ANNUAL REPORT** | **4** |
| 2, 3 | 07/01/2013 | 12/31/2013 | IP 7111406 | Drill Evaluation | |
| | | | **MODS** | **- PERMANENT PLANT MODIFICATIONS** | **7** |
| 2, 3 | 01/28/2013 | 02/01/2013 | IP 7111117T | Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications | |
| 2, 3 | 02/11/2013 | 02/15/2013 | IP 7111117T | Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications | |
| | | | **EP PROGR** | **- EP PROGRAM INSPECTION** | **1** |
| 2, 3 | 02/11/2013 | 02/15/2013 | IP 7111402 | Alert and Notification System Testing | |
| 2, 3 | 02/11/2013 | 02/15/2013 | IP 7111403 | Emergency Preparedness Organization Staffing and Augmentation System | |
| 2, 3 | 02/11/2013 | 02/15/2013 | IP 7111404 | Emergency Action Level and Emergency Plan Changes | |
| 2 | 02/11/2013 | 02/15/2013 | IP 7111405 | Correction of Emergency Preparedness Weaknesses and Deficiencies | |
| | | | **8/12 EXM** | **- MILLSTONE 2 INITIAL EXAM** | **4** |
| 2 | 07/15/2013 | 07/19/2013 | U01871 | FY13-MILLSTONE 2 INITIAL OPERATOR LICENSING EXAM | |
| 2 | 08/12/2013 | 08/16/2013 | U01871 | FY13-MILLSTONE 2 INITIAL OPERATOR LICENSING EXAM | |
| | | | **7111108P** | **- U3 INSERVICE INSPECTION** | **1** |
| 3 | 04/15/2013 | 04/26/2013 | IP 7111108P | Inservice Inspection Activities - PWR | |
| | | | **71124** | **- OCC RADIATION SAFETY** | **1** |
| 2, 3 | 04/29/2013 | 05/03/2013 | IP 71124.01 | Radiological Hazard Assessment and Exposure Controls | |
| 2, 3 | 04/29/2013 | 05/03/2013 | IP 71124.02 | Occupational ALARA Planning and Controls | |
| | | | **71124** | **- REMP** | **1** |
| 2, 3 | 05/20/2013 | 05/24/2013 | IP 71124.07 | Radiological Environmental Monitoring Program | |
| | | | **7111111B** | **- MILLSTONE 3 REQUAL INSP WITH P/F RESULTS** | **2** |
| 3 | 08/26/2013 | 08/30/2013 | IP 7111111B | Licensed Operator Requalification Program | |
| | | | **TRI FI** | **- TRIENNIAL FIRE PROTECTION INSPECTION** | **7** |
| 2, 3 | 07/22/2013 | 07/26/2013 | IP 7111105T | Fire Protection [Triennial] | |
| 2, 3 | 08/05/2013 | 08/09/2013 | IP 7111105T | Fire Protection [Triennial] | |
| | | | **10/21EXM** | **- MILLSTONE 3 INITIAL EXAM** | **4** |
| 3 | 11/04/2013 | 11/08/2013 | U01874 | FY14-MILLSTONE 3 INITIAL OPERATOR LICENSING EXAM | |
| 3 | 12/02/2013 | 12/11/2013 | U01874 | FY14-MILLSTONE 3 INITIAL OPERATOR LICENSING EXAM | |

This report does not include INPO and OUTAGE activities.
This report shows only on-site and announced inspection procedures.

# Millstone
## Inspection / Activity Plan
## 07/01/2012 - 12/31/2013

| Unit Number | Planned Dates Start | End | Inspection Activity | Title | No. of Staff on Site |
|---|---|---|---|---|---|
| | | | **7111107T - TRIENNIAL HEAT SINK** | | **1** |
| 2, 3 | 07/29/2013 | 08/09/2013 | IP 7111107T | Heat Sink Performance | |
| | | | **71124 - RADIO EFFLUENTS** | | **1** |
| 2, 3 | 08/26/2013 | 08/30/2013 | IP 71124.06 | Radioactive Gaseous and Liquid Effluent Treatment | |
| 2, 3 | 08/26/2013 | 08/30/2013 | IP 71151 | Performance Indicator Verification | |
| | | | **71124 - ALARA, IN-PLANT AIRBORNE AND DOSE ASSESS** | | **1** |
| 2, 3 | 09/23/2013 | 09/27/2013 | IP 71124.02 | Occupational ALARA Planning and Controls | |
| 2, 3 | 09/23/2013 | 09/27/2013 | IP 71124.03 | In-Plant Airborne Radioactivity Control and Mitigation | |
| 2, 3 | 09/23/2013 | 09/27/2013 | IP 71124.04 | Occupational Dose Assessment | |
| | | | **71124 - RAD HAZARD, IN-PLANT AIRBORNE, DOSE ASSE** | | **1** |
| 2, 3 | 12/16/2013 | 12/20/2013 | IP 71124.01 | Radiological Hazard Assessment and Exposure Controls | |
| 2, 3 | 12/16/2013 | 12/20/2013 | IP 71124.03 | In-Plant Airborne Radioactivity Control and Mitigation | |
| 2, 3 | 12/16/2013 | 12/20/2013 | IP 71124.04 | Occupational Dose Assessment | |
| 2, 3 | 12/16/2013 | 12/20/2013 | IP 71151 | Performance Indicator Verification | |

**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
**REGION I**
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

November 2, 2012

Mr. David Heacock
President and Chief Nuclear Officer
Dominion Resources
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION – NRC INTEGRATED INSPECTION REPORT 05000336/2012004 AND 05000423/2012004

Dear Mr. Heacock:

On September 30, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Millstone Power Station, Units 2 and 3. The enclosed inspection report documents the inspection results, which were discussed on October 24, 2012 with Stephen E. Scace, Site Vice President, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents one NRC-identified finding and one self-revealing finding of very low safety significance (Green). These findings were determined to involve violations of NRC requirements. However, because of the very low safety significance, and because they are entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCV), consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest any NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Senior Resident Inspector at Millstone. In addition, if you disagree with the cross-cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Senior Resident Inspector at Millstone.

In accordance with 10 CFR 2.390 of the NRCs "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the

NRC's document system Agencywide Documents Access Management Systems (ADAMS). ADAMS is accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

***/RA/***

Ronald R. Bellamy, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Docket Nos.: 50-336, 50-423
License Nos.: DRP-65, NPF-49

Enclosure: Inspection Report 05000336/2012004 and 05000423/2012004
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Sincerely,

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REGION I

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| Docket Nos.: | 50-336, 50-423 |
| License Nos.: | DPR-65, NPF-49 |
| Report No.: | 05000336/2012004 and 05000423/2012004 |
| Licensee: | Dominion Nuclear Connecticut, Inc. |
| Facility: | Millstone Power Station, Units 2 and 3 |
| Location: | P.O. Box 128<br>Waterford, CT 06385 |
| Dates: | July 1, 2012 through September 30, 2012 |
| Inspectors: | J. Ambrosini, Sr. Resident Inspector, Division of Reactor Projects (DRP)<br>J. Krafty, Resident Inspector, DRP<br>B. Haagensen, Resident Inspector, DRP<br>B. Smith, Resident Inspector, DRP, Pilgrim<br>T. O'Hara, Reactor Inspector, Division of Reactor Safety (DRS)<br>J. Furia, Senior Health Physicist, DRS<br>M. Modes, Senior Reactor Inspector, DRS<br>J. Kulp, Senior Resident Inspector, DRP, Oyster Creek |
| Approved By: | Ronald R. Bellamy, Chief<br>Reactor Projects Branch 5<br>Division of Reactor Projects |

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## SUMMARY OF FINDINGS

IR 05000336/2012004, 05000423/2012004; 7/1/2012 - 9/30/2012; Millstone Power Station Units 2 and 3; Post Maintenance Testing; Follow-Up of Events and Notices of Enforcement Discretion.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. Two Green findings, both of which were non-cited violations (NCV), were identified. The significance of inspection findings are indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). The cross-cutting aspects for the findings were determined using IMC 0310, "Components Within Cross-Cutting Areas." Findings for which the SDP does not apply may be Green, or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4.

**Cornerstone: Mitigating Systems**

- Green. A self-revealing Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified when the corrective action to prevent recurrence of a significant condition adverse to quality did not preclude repetition of the event. Specifically, Dominion generated a corrective action to prevent recurrence during a root cause evaluation (RCE) for a reactor power transient that occurred in February 2011 and a similar event occurred in November 2011, which was determined to be a repeat of the February 2011 event. Dominion entered this issue into their corrective action program (CAP) as condition report (CR) 488587.

  This finding was more than minor because if left uncorrected, it has the potential to lead to a more significant safety concern. The inspectors determined that this finding was associated with the Mitigating System Cornerstone and was reactivity control systems degradation related to reactivity management due to command and control issues identified in Dominion's RCEs for both the February and November 2011 events. Additional screening through the SDP directed the inspectors to Appendix M "Significance Determination Process Using Qualitative Criteria." Based upon the results of this evaluation and taking into account mitigating factors associated with additional corrective actions taken following the November 2011 event, and Dominion's acceptable performance during the November 2011 through September 2012 time period, the NRC has concluded that the finding was of very low safety significance (Green). This finding has a cross-cutting aspect in the Problem Identification and Resolution cross-cutting area, Corrective Action Program component, because Dominion did not take appropriate corrective actions to address significant conditions adverse to quality and preclude their repetition. [P.1(d)] (Section 4OA3)

**Cornerstone: Barrier Integrity**

- Green. The inspectors identified an NCV of 10 CFR 50, Appendix 'B,' Criteria V, "Instructions, Procedures, and Drawings," of very low safety significance (Green) for Dominion's failure to adequately specify post maintenance test (PMT) requirements for the control room ventilation exhaust fan 1B (3HVC*FN1B) following replacement of the breaker starter on June 19, 2012. Specifically, Dominion did not provide sufficient direction to the operations staff in the control room regarding the correct retest procedure or acceptance criteria to complete an adequate PMT. As a result, 3HVC*FN1B was retested and returned

to an operable status despite the inability of this fan to respond to a control building isolation (CBI) actuation signal. Subsequently, on June 21, 2012, train 'B' heating and ventilation control room (HVC) was declared inoperable after the HVC system failed routine surveillance test SP 3614F.1-002, "Control Room Emergency Filtration System Operability Test." Dominion identified that the auxiliary contacts for the 42x relay had not been correctly installed in the breaker for 3HVC*FN1B, which would have prevented the automatic starting of the fan during a CBI signal. The PMT acceptance criteria, specified in design change MP3-11-01065 and translated into work order 53102451547 had been met but were not adequate to retest the breaker. Dominion entered this issue into their CAP as CR 492783.

The finding is more than minor because it affected the Design Control attribute of the control room ventilation boundary barrier for the Barrier Integrity cornerstone. Additionally, the performance deficiency was similar to example 5.b in Appendix E of Manual Chapter 0612, "Examples of Minor Issues." In accordance with IMC 0609, "Significant Determination Process," the inspectors performed a Phase 1 analysis and determined that the finding was of very low significance because the finding represented a degradation of the control room radiological barrier function but not degradation against smoke or toxic gas. This finding had a cross-cutting aspect in the Human Performance cross-cutting area, Resources component, because Dominion failed to maintain accurate and up to date procedures and work packages for PMTs following installation of the design change to replace the breaker for 3HVC*FN1B. [H.2(c)] (Section 1R19)

## REPORT DETAILS

Summary of Plant Status

Millstone Unit 2 and 3 began the inspection period operating at 100 percent power. On August 19, Unit 2 was shut down due to high ocean water temperature and returned to 100 percent power on August 25. On September 19, Unit 3 reduced power from 100 percent to 75 percent because of storm-related condenser fouling. Unit 3 returned to 100 percent power on September 20.

### 1. REACTOR SAFETY

**Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**

1R01 Adverse Weather Protection (71111.01 – 1 sample)

Readiness for Impending Adverse Weather

a. Inspection Scope

The inspectors reviewed Dominion's response to elevated ultimate heat sink temperatures due to extreme heat on August 10. The inspectors verified that operators properly monitored important plant equipment that could have been affected by the hot weather conditions. The inspectors ensured that temperatures for equipment and areas in the plant were maintained within procedural limits, and when necessary, compensatory actions were properly implemented in accordance with procedures. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04Q – 5 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

Unit 2

- Facility 2 Common Emergency Core Cooling System (ECCS) Suction Header while the Facility 1 suction header was out of service (OOS) for testing on July 30
- Facility 1 Service Water (SW) header while the Facility 2 header was OOS for scheduled maintenance and testing on September 20

Unit 3

- 'B' Quench Spray System (QSS) while the 'A' train was OOS for surveillance testing on August 1

- 'B' Emergency Diesel Generator (EDG) while the 'A' EDG was OOS for scheduled maintenance on August 8
- 'A' SW train while the 'C' SW strainer was OOS for scheduled maintenance on August 27

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the Updated Final Safety Analysis Report (UFSAR), Technical Specifications (TS), work orders, Condition Reports (CR), and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted system performance of their intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether Dominion staff had properly identified equipment issues and entered them into their CAP for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

.2 Full System Walkdown (71111.04S – 1 sample)

a. Inspection Scope

On September 17, 18 and 19, the inspectors performed a complete system walkdown of accessible portions of the Unit 2 High Pressure Safety Injection (HPSI) system to verify the existing equipment lineup was correct. The inspectors reviewed operating procedures, surveillance tests, drawings, equipment line-up check-off lists, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, component lubrication and equipment cooling, hangar and support functionality, and operability of support systems. The inspectors performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. Additionally, the inspectors reviewed a sample of related CR and work orders to ensure Dominion appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Resident Inspector Quarterly Walkdowns (71111.05Q – 6 samples)

a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that Dominion controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in the area pre-fire plan, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for OOS, degraded or inoperable fire protection equipment, as applicable, in accordance with procedures.

Unit 2

- Auxiliary Building HPSI Pump Room, Fire Area A-4 on July 6
- Auxiliary Building Containment Spray and "HPSI/LPSI" Pump Room, Fire Area A-8 on July 6
- Charging Pump Room, Fire Area A-6 on July 20
- East Penetration/East Main Steam Safety Valve Rooms, Fire Area A-10 on July 27

Unit 3

- Terry Turbine Room, Fire Area ESF-5 on August 18
- East MCC and Rod Control, Fire Area AB-5 on September 7

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)

Internal Flooding Review

a. Inspection Scope

The inspectors reviewed the UFSAR, the site flooding analysis, and plant procedures to assess susceptibilities involving internal flooding. The inspectors also reviewed the CAP to determine if Dominion identified and corrected flooding problems and whether operator actions for coping with flooding were adequate. The inspectors also focused on the Unit 2 Cable Vault to verify the adequacy of equipment seals located below the flood line, floor and water penetration seals, watertight door seals, common drain lines and sumps, sump pumps, level alarms, control circuits, and temporary or removable flood barriers.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (711111.07A – 1 sample)

a. Inspection Scope

The inspectors reviewed the Unit 2 'C' Reactor Building Component Cooling Water (RBCCW) heat exchanger to determine its readiness and availability to perform its safety functions. The inspectors reviewed the design basis for the component and verified Dominion's commitments to NRC Generic Letter 89-13. The inspectors reviewed the results of previous inspections of the RBCCW heat exchanger. The inspectors discussed the results of the most recent inspection with engineering staff and reviewed pictures of the as-found and as-left conditions. The inspectors verified that Dominion initiated appropriate corrective actions for identified deficiencies. The inspectors also verified that the number of tubes plugged within the heat exchanger did not exceed the maximum amount allowed.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11 – 4 samples)

.1 Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed Unit 2 licensed operator simulator training on July 24, which included a dropped rod, a steam line rupture outside of containment with a loss of offsite power, and a loss of auxiliary feedwater. The inspectors observed a Unit 3 licensed operator simulator training drill on July 17, which included a fire and a turbine trip without a corresponding reactor trip. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the TS action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

.2 Quarterly Review of Licensed Operator Performance in the Main Control Room

a. Inspection Scope

On August 18, the inspectors observed Unit 3 main turbine control valve testing on portions of the power reduction to establish initial conditions for the test, and portions of the power ascension following testing. The inspectors also observed Unit 2 reactor and plant startup on August 23 following a TS required shutdown for ultimate heat sink

temperature. The inspectors observed test and reactivity control briefings to verify that the briefings met the criteria specified in Dominion's Operations Standards and Expectations Handbook. Additionally, the inspectors observed test performance to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12 – 1 sample)

a. Inspection Scope

The inspectors reviewed one sample to assess the effectiveness of maintenance activities on the Emergency Safeguards Actuation System (ESAS) on Unit 3. The inspectors reviewed system health reports, CAP documents, maintenance work orders, and maintenance rule basis documents to ensure that Dominion was identifying and properly evaluating performance problems within the scope of the maintenance rule. The inspectors verified that the ESAS was properly scoped into the Maintenance Rule in accordance with 10 CFR 50.65 and verified that the paragraph (a)(2) performance criteria established by Dominion staff was reasonable. As applicable, for ESASs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these ESAS to (a)(2). Additionally, the inspectors ensured that Dominion staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 5 samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that Dominion performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that Dominion personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When Dominion performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the TS requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

Unit 2

- Shutdown Risk associated with forced plant shutdown in Mode 5 conditions on August 15
- Unplanned unavailability of 'A' EDG on September 9
- Increased risk due to degraded intake structure conditions and potential impact to offsite power because of severe weather on September 18
- Pre-2R21 shutdown risk assessment on September 25

Unit 3

- Revision to equipment out of service (EOOS) on-line Risk Monitor Application (effective September 11, 2012)

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 6 samples)

a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions:

Unit 2

- CR483716, Safety Related Portions of spent fuel pool cooling and reactor water storage tank (RWST) may be cross-tied to Non-SR SSCs on August 9
- OD 000498, Unit 2 SW Pipe Supports, Revision 0 on August 29
- CR485444, ESAS Actuation Cabinet 5 Control Power Light will not light on September 5
- OD 000502, SW flange thinning

Unit 3

- OD000237, Revision 2 CTV41 Hydraulic Actuator Degraded on August 15
- OD000237, Revision 3 CTV41 Non-conforming Hydraulic Actuators on September 19

The inspectors selected these issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the operability determinations to assess whether TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TS and UFSAR to Dominion's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled by Dominion. The

inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 8 samples)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed the test procedures to verify that the procedure adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure was consistent with the information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed the test or reviewed test data to verify that the test results adequately demonstrated restoration of the affected safety functions.

Unit 2

- 'C' SW Pump overhaul on July 2
- 'B' EDG overspeed switch replacement on July 2
- Pressurizer proportional heater repair on July 24
- 'A' HPSI pump coupling lubrication preventive maintenance on July 31
- 'B' EDG governor replacement on August 21

Unit 3

- 3HVC*FN1B breaker replacement on June 19
- 'B' EDG jacket water heat exchanger repairs for leakage on July 25
- 'A' EDG maintenance outage on August 9

b. Findings

Introduction. The inspectors identified a NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," of very low safety significance (Green) for Dominion's failure to adequately prescribe the correct retest instructions and acceptance criteria to ensure safety-related design changes received the appropriate PMT for breaker replacement on the Unit 3 control room ventilation exhaust fan, 3HVC*FN1B.

Description. On June 19, 2012, the operators conducted a PMT after replacing the starter assembly in the breaker for 3HVC*FN1B (Control Building Filter Unit Exhaust Fan 1B) and determined that the breaker had met the retest acceptance criteria. Train 'B' of the HVC system was declared operable and restored to service in a standby capacity. Subsequently, on June 21, 2012, train 'B' HVC was declared inoperable after the HVC system failed a routine surveillance test SP-3614F.1-002, "Control Room Emergency Filtration System Operability Test." The operators entered TS 3.7.7, and invoked a

seven day shutdown requirement effective June 19. Dominion identified that the auxiliary contacts for the 42x relay had not been correctly installed in the breaker for 3HVC*FN1B, which would have prevented the automatic starting of the fan in response to a CBI signal. The inspectors identified that the PMT acceptance criteria, specified in design change MP3-11-01065, and translated into work order 53102451547 had been met but were not sufficient to properly test all safety functions supported by the breaker.

The inspectors interviewed operations and engineering personnel and reviewed related PMT program documentation and determined that the work order did not provide enough direction to perform an effective PMT. VPAP-2003, "Post Maintenance Testing Program" and MP-20-WP-GDL40, "Pre and Post Maintenance Testing," required the test procedure and acceptance criteria to be sufficiently specified in the work orders. However, the work order referred back to section 7 step 6 of the design change package which stated: "Perform a functional test by operating the load (starting pumps/fans) and check for proper indication." The operator started and stopped 3HVC*FN1B successfully and accepted the PMT test results as satisfactory. This PMT did not require retesting the CBI auto-start function even though the "as-left work performed" section stated that there was a discrepancy between the circuit drawing and the installed configuration regarding a set of contacts. 3HVC*FN1B was returned to service without identifying the auxiliary contacts were not tested during the PMT and without resolving the failure of CBI to actuate.

The inspectors concluded that the work order 53102451547 failed to adequately prescribe instructions to ensure safety-related design changes had been correctly installed and tested. Dominion entered this issue into their CAP as CR479475, CR479760 and CR479842 and completed apparent cause analysis (ACE) 191185 which had concluded that the operator who retested the breaker should have recognized the problem with the auxiliary contacts. The inspectors concluded that the operator had followed the work package retest directions but that the work package did not have adequate instructions specifying the retest procedure or the test acceptance criteria.

Analysis. The inspectors determined that the failure to adequately prescribe the post maintenance test procedure and acceptance criteria to ensure the operability of a safety-related design change prior to restoring the system to service was a performance deficiency (PD). The cause was reasonably within Dominion's ability to foresee and correct and should have been prevented. Traditional enforcement does not apply since there were no actual safety consequences, no impacts on the NRC's ability to perform its regulatory function and no willful aspects to the finding. The inspectors reviewed IMC 0612, "Power Reactor Inspection Reports," and determined the finding was more than minor because it affected the Design Control attribute of the control room ventilation boundary barrier in the Barrier Integrity cornerstone. Additionally, the PD was similar to example 5.b in IMC 0612 Appendix E. The failure to properly specify a test procedure and adequate acceptance criteria in the work order caused the restoration of the control room ventilation system without identifying that it would not have performed its safety function during a control building isolation.

In accordance with IMC 0609, "Significant Determination Process," the inspectors performed a Phase 1 analysis and determined that the finding was of very low safety significance (Green) because the finding represented a degradation of the control room radiological barrier function but not degradation against CBI actuation due to smoke or toxic gas.

This finding had a cross-cutting aspect in the Human Performance cross-cutting area, Resources component, because Dominion failed to maintain accurate and up to date procedures and work packages for PMTs following installation of the design change to replace the breaker for 3HVC*FN1B. [H.2(c)]

Enforcement. 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," states in part that activities affecting quality shall be prescribed by documented instructions and procedures. Contrary to the above, on June 19, 2012 the licensee's work order 53102451547 failed to adequately specify the correct retest procedure and acceptance criteria to ensure design change MP3-11-01065 received the appropriate PMT as required by MP-20-WP-GDL40 to verify operability of 3HVC*FN1B. On June 21, 2012, Dominion identified and corrected the degraded breaker starter assembly. Because the finding is of very low safety significance and it was entered into Dominion's CAP as CR492783, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: (**NCV 05000423/2012002-01, Inadequate Post Maintenance Test Directions following Design Change to 3HVC*FN1B).**

1R20 Refueling and Other Outage Activities (71111.20 – 1 sample)

a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the Unit 2 forced outage for ultimate heat sink temperatures greater than the TS limits August 12 through August 24. The inspectors reviewed Dominion's development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. During the outage, the inspectors observed portions of the shutdown and cooldown processes and monitored controls associated with the following outage activities:

- Configuration management, including maintenance of defense-in-depth, commensurate with the outage plan for the key safety functions and compliance with the applicable TS when taking equipment OOS
- Implementation of clearance activities and confirmation that tags were properly hung and that equipment was appropriately configured to safely support the associated work or testing
- Status and configuration of electrical systems and switchyard activities to ensure that TS were met
- Monitoring of decay heat removal operations
- Activities that could affect reactivity
- Maintenance of secondary containment as required by TS
- Identification and resolution of problems related to outage activities

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 5 samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs to assess whether test results satisfied TS, the UFSAR, and Dominion procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

Unit 2

- SP 2401I, Local Power Density Test, Revision 011-01 on July 23
- SP 2610AO-001, 'A' AFW Pump and Recirc Check Valve IST, Facility 1, Revision 000-01 on August 28 (IST)

Unit 3

- SP 3609.1, Quench Spray Pump 3QSS*P3A Operational Readiness Test, Revision 011-01 on August 1 (IST)
- SP 3446B12, Train 'B' Solid state Protection System Operational Test, Revision 012-04 on August 30
- SP 3646A.8, Containment Isolation Phase A S920 – Relay K630, Slave Relay Actuation, Revision 023-09 on September 6

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness**

1EP6 Drill Evaluation (71114.06 – 1 sample)

Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine Dominion emergency drill on July 17 to identify any weaknesses and deficiencies in the classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator and emergency operations facility to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the station drill critique to compare inspector observations with those identified by Dominion staff in order to evaluate Dominion's critique and to verify whether the Dominion staff was properly identifying weaknesses and entering them into their CAP.

b. Findings

No findings were identified.

## 2. RADIATION SAFETY

**Cornerstone: Occupational Radiation Safety**

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation (71124.08 -1 sample)

a. Inspection Scope

This area was inspected to verify the effectiveness of Dominion's programs for processing, handling, storage, and transportation of radioactive material. The inspectors used the requirements of 10 CFR Parts 20, 61, and 71, and 10 CFR Part 50 Appendix A Criterion 63, "Monitoring Fuel and Waste Storage," and Dominion procedures required by the TS/Process Control Program (PCP) as criteria for determining compliance.

The inspectors reviewed the solid radioactive waste system description in the final safety analysis report (FSAR), the PCP, and the recent radiological effluent release report for information on the types, amounts, and processing of radioactive waste disposed.

The inspectors reviewed the scope of any quality assurance (QA) audits in this area since the last inspection.

The inspectors selected areas where containers of radioactive waste were stored, and verified that the containers were labeled in accordance with 10 CFR 20.1904, "Labeling Containers," or controlled in accordance with 10 CFR 20.1905, "Exemptions to Labeling Requirements," as appropriate.

The inspectors verified that the radioactive materials storage areas were controlled and posted in accordance with the requirements of 10 CFR Part 20, "Standards for Protection Against Radiation." For materials stored or used in the controlled or unrestricted areas, the inspectors verified that they were secured against unauthorized removal and controlled in accordance with 10 CFR 20.1801, "Security of Stored Material," and 10 CFR 20.1802, "Control of Material not in Storage," as appropriate.

The inspectors verified that Dominion had established a process for monitoring the impact of long-term storage (e.g., buildup of any gases produced by waste decomposition, chemical reactions, container deformation, loss of container integrity, or re-release of free-flowing water) sufficient to identify potential unmonitored, unplanned releases, or nonconformance with waste disposal requirements. The inspectors verified that there were no signs of swelling, leakage, and deformation.

The inspectors walked down accessible portions of liquid and solid radioactive waste processing systems to verify and assess that the current system configuration and operation agree with the descriptions in the FSAR, offsite dose calculation manual and PCP.

The inspectors identified radioactive waste processing equipment that was not operational and/or was abandoned in place, and verified that Dominion had established administrative and/or physical controls to ensure that the equipment would not contribute to an unmonitored release path and/or affect operating systems or be a source of unnecessary personnel exposure. The inspectors verified that Dominion had reviewed the safety significance of systems and equipment abandoned in place in accordance with 10 CFR 50.59, "Changes, Tests, and Experiments."

The inspectors reviewed the adequacy of any changes made to the radioactive waste processing systems since the last inspection. The inspectors verified that changes were reviewed and documented in accordance with 10 CFR 50.59 as appropriate.

The inspectors identified processes for transferring radioactive waste resin and/or sludge discharges into shipping/disposal containers. The inspectors verified that the waste stream mixing, sampling procedures, and methodology for waste concentration averaging were consistent with the PCP, and provided representative samples of the waste product for the purposes of waste classification as described in 10 CFR 61.55, "Waste Classification."

For those systems that provide tank recirculation, the inspectors verified that the tank recirculation procedure provided sufficient mixing.

The inspectors verified that Dominion's PCP correctly described the current methods and procedures for dewatering waste.

The inspectors identified radioactive waste streams, and verified that Dominion's radiochemical sample analysis results were sufficient to support radioactive waste characterization as required by 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste." The inspectors verified that Dominion's use of scaling factors and calculations to account for difficult-to-measure radionuclides was technically sound and based on current 10 CFR Part 61 analysis.

For the waste streams identified above, the inspectors verified that changes to plant operational parameters were taken into account to (1) maintain the validity of the waste stream composition data between the annual or biennial sample analysis update, and (2) verify that waste shipments continued to meet the requirements of 10 CFR Part 61.

The inspectors verified that Dominion had established and maintained an adequate QA program to ensure compliance with the waste classification and characterization requirements of 10 CFR 61.55, "Waste Classification," and 10 CFR 61.56, "Waste Characteristics."

The inspectors observed shipment packaging, surveying, labeling, marking, placarding, vehicle checks, emergency instructions, disposal manifest, shipping papers provided to the driver, and Dominion verification of shipment readiness. The inspectors verified that the requirements of any applicable transport cask certificate of compliance had been met. The inspectors verified that the receiving licensee was authorized to receive the shipment packages.

The inspectors determined that the shippers were knowledgeable of the shipping regulations and that shipping personnel demonstrated adequate skills to accomplish the

package preparation requirements for public transport with respect to Dominion's response to NRC Bulletin 79-19, "Packaging of Low-Level Radioactive Waste for Transport and Burial," dated August 10, 1979, and 49 CFR Part 172, "Hazardous Materials Table, Special Provisions, Hazardous Materials Communication, Emergency Response Information, Training Requirements, and Security Plans," Subpart H, "Training." The inspectors verified that Dominion's training program provided training to personnel responsible for the conduct of radioactive waste processing and radioactive material shipment preparation activities.

The inspectors selected non-excepted package shipment records and verified that the shipping documents indicated the proper shipper name; emergency response information and a 24-hour contact telephone number; accurate curie content and volume of material; and appropriate waste classification, transport index, and UN number. The inspectors verified that the shipment placarding was consistent with the information in the shipping documentation.

The inspectors verified that problems associated with radioactive waste processing, handling, storage, and transportation, were being identified by Dominion at an appropriate threshold, were properly characterized, and were properly addressed for resolution in Dominion's CAP. The inspectors verified the appropriateness of the corrective actions for a selected sample of problems documented by Dominion that involved radioactive waste processing, handling, storage, and transportation.

The inspectors reviewed the results of selected audits performed since the last inspection and evaluated the adequacy of Dominion's corrective actions for issues identified during those audits.

b. Findings

No findings were identified.

## 4. OTHER ACTIVITIES

### 4OA1 Performance Indicator Verification (71151 – 10 samples)

#### .1 Mitigating Systems Performance Index

a. Inspection Scope

The inspectors reviewed Dominion's submittal of the Mitigating Systems Performance Index (MSPI) for the following systems for the period of July 1, 2011 through June 30, 2012. To determine the accuracy of the performance indicator data reported during those periods, inspectors used definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 10 CFR 50.73." The inspectors reviewed Dominion operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, CR, event reports and NRC integrated inspection reports to validate the accuracy of the submittals.

Unit 2

- MSPI HPSI System
- MSPI AFW System
- MSPI Emergency AC Power System
- MSPI Residual Heat Removal (RHR) System
- MSPI Support Cooling Water System

Unit 3

- MSPI HPSI System
- MSPI AFW System
- MSPI Emergency AC Power System
- MSPI RHR System
- MSPI Support Cooling Water System

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 2 samples)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that Dominion entered issues into their CAP at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP and periodically attended CR screening meetings.

b. Findings

No findings were identified.

.2 Annual Sample: Review of Commitment Tracking System

a. Inspection Scope

During July 30 through August 1, the inspectors conducted a review of the corrective actions taken by Dominion in response to an NRC audit of the commitment management program at Dominion's Millstone Station performed by the NRC on November 15 and 16, 2011. The NRC's audit reviewed eleven commitments, submitted in correspondence to the NRC since the prior NRC commitment audit conducted on May 20, 2008. The inspectors noted that Dominion later combined two of the commitments as duplicative, making the current total ten.

While generating the list of eleven commitments, at the request of the NRC, Dominion discovered a disparity between the commitments entered into, and acted upon, in the station wide CAP and the number of commitments being tracked by the Millstone Regulatory Affairs department. As identified in the NRC audit, reported December 28, 2011, seven of the eleven commitments in the CAP were not in the Millstone Commitment Tracking System Database. The database is used at Millstone, by the Regulatory Affairs staff, to verify that NRC commitments are properly characterized and tracked.

The inspectors verified that every one of the commitments, originally missing from the commitment tracking database, was in the CAP and that appropriate actions had been taken to address the commitment. At the time of this inspection all the commitments had been implemented and the corrective actions closed. The inspectors determined that at no time did the absence or presence of a commitment in the regulatory affairs tracking system affect the actual implementation and follow through on the commitment in the CAP. The problem was solely administrative in nature. The inspectors reviewed the original list of commitments to determine the relative importance of the commitment to the safe operation of the plant and evaluated the actions taken to implement the commitment in this context. The inspectors reviewed Dominion's response to the reported omissions to determine if the extent-of-condition was captured and independently evaluated the corrective action database for commitments.

The inspectors specifically reviewed the commitments that were not entered into the Millstone Commitment Tracking Database. The commitments reviewed by the inspectors, as originally reported to the NRC and currently captured by Millstone are:

- DNC Letter 11-476, (ADAMS ML11234A077), Replace SW Leaking Flange
- DNC Letter 07-0834C (ADAMS ML080100600) Response to EEEB-07-0052
- DNC Letter 07-0834K (ADAMS ML 080850894) Motor Operator Insulation
- DNC Letter 07-0450F (ADAMS ML 081150679) FSAR Changes
- DNC Letter 09-084 (ADAMS ML090650513) Respond to Questions 21 & 24
- DNC Letter 07-045H (ADAMS ML081420443) Attachment Commitments

The inspectors reviewed the revised Dominion Administrative Procedure, "Commitment Management," LI-AA-110, and Licensing "Proofreader Checklist – Outgoing Correspondence," to identify if the revisions captured the necessary changes and verified the implementation of the revised procedure. The procedure was revised effective May 3, 2012, adding an additional checklist that included the requirement to record a commitment identified in the cover letter in correspondence with the NRC. The inspectors noted the proofreader checklist was revised to require review for commitment entry into the new Regulatory Commitment Database which is a redundant check of the checklist introduced in the procedure.

The inspectors reviewed the eleven commitments (NRC Audit Report Table 2) associated with the exemption granted (ML050420058) by the NRC to the requirements of 10 CFR 50.68(b)(1). The exemption places very specific limitations and/or conditions on Dominion in Section 3.4 that supersede the commitments. These limitations and conditions are obligations under the accepted definition in NEI 99-04. The commitments made by Dominion during the exemption review process do not take on a special status after the exemption is granted because the exemption does not refer to the commitments or restrain them in any way. The inspectors reviewed corrective action

CR432849, "Report exemption not needed, revising commitment," dated June 3, 2011, withdrawing the request for exemption.

b. Findings and Observations

No findings were identified.

The inspectors determined that the issues reviewed did not adversely affect the capability of the licensee to implement regulatory commitments.

.3 Annual Sample: Moisture Separator Reheater Low Load Valves Reactivity Incident

a. Inspection Scope

The inspectors performed an in-depth review of Dominion's ACE 18826 and corrective actions associated with CR439884, Moisture Separator Reheater (MSR) Low Load Valves Reactivity Incident on Unit 2. Specifically, the low load valves were incorrectly calibrated, which resulted in high differential temperature between the two steam lines entering each low pressure turbine. Operators secured the second stage reheat steam to the MSRs to eliminate the high differential temperature. The decrease in steam demand required insertion of Group 7 Control Element Assemblies four steps.

The inspectors assessed Dominion's problem identification threshold, cause analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of Dominion's corrective actions to determine whether Dominion was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of Dominion's CAP and 10 CFR 50, Appendix B. In addition, the inspectors reviewed revised procedures and interviewed maintenance and operations personnel to assess the effectiveness of the implemented corrective actions.

b. Findings and Observations

No findings were identified.

The inspectors determined that the ACE adequately identified the issue, cause, and contributing causes. The inspectors determined that the extent of condition to review I&C loop calibration folders for loops that could impact reactivity was appropriate. The inspectors also determined that the corrective action assignments were appropriate.

In the review of the corrective actions, the inspectors determined that CA218136, which was to develop a strategy to incorporate loop calibration folders into calibration procedures for instruments affecting reactivity with a follow-on assignment to implement, was closed out.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 1 sample)

Plant Events

a. Inspection Scope

For the plant events listed below, the inspectors reviewed and/or observed plant parameters, reviewed personnel performance, and evaluated performance of mitigating systems. The inspectors communicated the plant events to appropriate regional personnel, and compared the event details with criteria contained in IMC 0309, "Reactive Inspection Decision Basis for Reactors," for consideration of potential reactive inspection activities. As applicable, the inspectors verified that Dominion made appropriate emergency classification assessments and properly reported the event in accordance with 10 CFR Parts 50.72 and 50.73. The inspectors reviewed Dominion's follow-up actions related to the events to assure that Dominion implemented appropriate corrective actions commensurate with their safety significance.

b. Findings

Introduction. A self-revealing Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified when the corrective action to prevent recurrence of a significant condition adverse to quality did not preclude repetition of the event. Specifically, Dominion generated a corrective action to prevent recurrence during a RCE for a reactor power transient that occurred in February 2011 and a similar event occurred in November 2011, which was determined to be a repeat of the February 2011 event.

Description. In February 2011, Millstone Unit 2 experienced an unintended 8 percent reactor power transient (88 percent to 96 percent) during quarterly main turbine valve control valve testing. The NRC dispatched a special inspection team to inspect the event and the inspection results are documented in "Millstone Power Station Unit 2 – NRC Special Inspection Report 05000336/2011008; Preliminary White Finding" (ML111470484), dated May 27, 2011. In summary, the special inspection team concluded that the primary cause of the event was ineffective reinforcement of Dominion operator standards and expectations.

Dominion performed a RCE of the event, determined a root cause, and generated a corrective action to prevent recurrence. Dominion documented their RCE in "Root Cause Evaluation RCE 00144, Unplanned 8 percent Power Excursion, Millstone Power Station Unit 2." In summary, the root cause of the event was identified as the failure to implement the crew performance management program effectively to correct observed Unit 2 crew performance deficiencies. The corrective action to prevent recurrence was to develop and fully implement an Operations Performance Management program which includes crew and individual performance monitoring and trending. Dominion implemented the corrective action to prevent recurrence on June 22, 2011.

At Dominion's request, a regulatory conference was held on July 19, 2011, at the NRC's Region I office in King of Prussia, Pennsylvania. The results of the regulatory conference are documented in an August 8, 2011 letter from the NRC to Mr. D. Heacock, President and Chief Nuclear Officer of Dominion Nuclear Connecticut, Inc, "FINAL SIGNIFICANCE DETERMINATION FOR A WHITE FINDING, WITH

ASSESSMENT FOLLOW-UP; NOTICE OF VIOLATION; AND RESULTS OF REGULATORY CONFERENCE [NRC SPECIAL INSPECTION REPORT NO. 05000336/2011010] – MILLSTONE UNIT" (ML112200394). The final significance of the preliminary White finding from the special inspection was confirmed to be of low to moderate safety significance (White).

Dominion documented the receipt of the final white finding in the corrective action program as CR437224. In accordance with Dominion procedure PI-AA-200, "Corrective Action Program," Attachment 4, "CR Significance Determination," Dominion rescreened the February 2011 event as a significance level 1 issue due to the receipt of a greater than green NRC finding. Dominion procedure PI-AA-200 paragraph 5.3.35 states that significance level 1 issues are significant conditions adverse to quality. Paragraph 5.3.35 further states that the cause of the condition must be determined and corrective action taken to preclude repetition.

In November 2011, Millstone Unit 3 experienced an unintended 6 percent reactor power transient (25 percent to 31 percent) during main turbine valve control valve testing following a refueling outage. Dominion performed a RCE of the event and documented their results in "Root Cause Evaluation RCE 001073: MP3 Allowable Temperature Low out of Band on Reactor Startup, Millstone Power Station Unit 3." In summary, the root cause of the event was identified as that operations supervision had been ineffective in demonstrating and communicating the importance of using required standards to perform all activities at Millstone. In section 1.3 of the RCE, Dominion identified that a contributing cause of the November 2011 event was a failure of operations department to effectively implement the corrective action to prevent recurrence identified for the February 2011 event. In section 2.6 of the RCE, Dominion identified that the November 2011 event was a repeat of the February 2011 event. As a result, additional corrective actions were put in place to supplement the corrective actions already in place to address the February 2011 event.

This self-revealing performance deficiency, a repeat event of a significant condition adverse to quality, was identified by the NRC in September 2012, while conducting NRC inspection procedure 95001, "Supplemental Inspection for One or Two White Inputs in a Strategic Performance Area," in response to the February 2011 event. The results of supplemental inspection are documented in NRC inspection report 05000336/2012011.

Analysis. The inspectors determined that not precluding repetition of a significant condition adverse to quality was a performance deficiency that was within Dominion's ability to foresee and correct. Specifically, the corrective action to prevent recurrence of the February 2011 event was ineffective to preclude repetition, as a repeat event occurred in November 2011. This finding was more than minor because if left uncorrected, it has the potential to lead to a more significant safety concern. The inspectors determined that this finding was associated with the Mitigating System Cornerstone and was reactivity control systems degradation related to reactivity management due to command and control issues identified in Dominion's RCEs for both the February and November 2011 events.

Using IMC 0609 Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating System Screening Questions," the inspectors determined the finding could be categorized as "mismanagement of reactivity by operators (e.g. inability to anticipate and control changes in reactivity during crew

operations)." As such, the inspectors were directed to use IMC 0609, Appendix M "Significance Determination Process Using Qualitative Criteria." In consultation with a Region I Senior Reactor Analyst, the minor increase in reactor power associated with the November 2011 reactivity event had no appreciable impact on unit core damage frequency. Based upon the results of this evaluation and taking into account mitigating factors associated with additional corrective actions taken following the November 2011 event, and Dominion's acceptable performance during the November 2011 through September 2012 time period, NRC has concluded that the finding was of very low safety significance (Green).

This finding has a cross-cutting aspect in the Problem Identification and Resolution cross-cutting area, Corrective Action Program component, because Dominion did not take appropriate corrective actions to address significant conditions adverse to quality and preclude their repetition. [P.1(d)]

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action" states, in part, "In the case of significant conditions adverse to quality, the measure shall assure that the cause of the condition is determined and corrective action taken to preclude repetition." Contrary to the above, Dominion's corrective action to prevent recurrence for the February 2011 event did not preclude repetition of the event as evidenced by a repeat event occurring in November 2011. Because this issue is of very low safety significance (Green) and Dominion entered this issue into their CAP as CR437224, this finding is being treated as an NCV consistent with the NRC Enforcement Policy. **(NCV 05000336/2012004-02, Corrective Action to Prevent Recurrence Ineffective to Preclude Repetition of a Significant Condition Adverse to Quality)**

## 4OA5 Other Activities

### .1 Temporary Instruction (TI) 2515/182, Review of the Industry Initiative to Control Degradation of Underground Piping and Tanks, Phase 1 (2515/182 – Phase 1)

a. Inspection Scope (1 sample)

Dominion's buried piping and underground piping and tanks program was inspected in accordance with paragraphs 03.01.a through 03.01.c of TI 2515/182 and was found to meet all applicable aspects of the NEI document 09-14, Revision 1, as set forth Table 1 of the TI 2515/182.

b. Findings

No findings were identified.

### .2 Temporary Instruction 2515/187 – Inspection of Near-Term Task Force Recommendation 2.3 – Flooding Walkdowns

On August 20, inspectors commenced activities to independently verify that Millstone conducted external flood protection walkdown activities using an NRC-endorsed walkdown methodology. These flooding walkdowns are being performed at all sites in response to Enclosure 4 of a letter from the NRC to licensees entitled, "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights

from the Fukushima Dai-ichi Accident," dated March 12, 2012 (ADAMS Accession No. ML12053A340). The results of this temporary instruction will be documented in a future inspection report.

.3 Temporary Instruction 2515/188 – Inspection of Near-Term Task Force Recommendation 2.3 – Seismic Walkdowns

On August 6, inspectors commenced activities to independently verify that Millstone conducted seismic walkdown activities using an NRC-endorsed seismic walkdown methodology. These seismic walkdowns are being performed at all sites in response to Enclosure 3 of a letter from the NRC to licensees entitled, "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," dated March 12, 2012 (ADAMS Accession No. ML12053A340). When complete, the results of this temporary instruction will be documented in a future inspection report.

4OA6 Meetings, Including Exit

On October 24, 2012 the inspectors presented the inspection results to Stephen E. Scace, Site Vice President, and other members of the Millstone staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

**ATTACHMENT: SUPPLEMENTARY INFORMATION**

## SUPPLEMENTARY INFORMATION

## KEY POINTS OF CONTACT

Licensee Personnel

| | |
|---|---|
| M. Adams | Plant Manager |
| V. Armentrout | Dominion Corporate Consulting Engineer |
| L. Armstrong | Manager, Training |
| R. Acquaro | Unit 3 Shift Manager |
| G. Auria | Nuclear Chemistry Supervisor |
| B. Bartron | Supervisor, Licensing |
| E. Brodeur | Unit 3 Shift manager |
| C. Chapin | Assistant Manager of Operations |
| W. Chestnut | Supervisor, Nuclear Shift Operations Unit 2 |
| F. Cietek | Nuclear Engineer, PRA |
| T. Cleary | Licensing Engineer |
| G. Closius | Licensing Engineer |
| L. Crone | Supervisor, Nuclear Chemistry |
| J. Curling | Manager, Protection Services |
| T. Davis | Supervisor Nuclear Engineering, Component Engineering |
| J. Dorosky | Health Physicist III |
| M. Fiala | SW System Engineer |
| M. Finnegan | Supervisor, Health Physics, ISFSI |
| A. Gharakhanian | Nuclear Engineer III |
| W. Gorman | Supervisor, Instrumentation & Control |
| J. Grogan | Assistant Operations Manager |
| K. Grover | Manager, Nuclear Operations |
| T. Hendy | Buried Piping Program Owner |
| C. Houska | I&C Technician |
| J. Kunze | Supervisor, Nuclear Operations Support |
| J. Laine | Manager, Radiation Protection/Chemistry |
| R. MacManus | Director, Nuclear Station Safety & Licensing |
| P. Maroch | Design Engineer |
| G. Marshall | Manager, Outage and Planning |
| M. Maxson | Manager, Nuclear Oversight |
| R. Riley | Supervisor, Nuclear Shift Operations Unit 3 |
| M. Roche | Senior Nuclear Chemistry Technician |
| L. Salyards | Licensing, Nuclear Technology Specialist |
| W. Saputo | HPSI System Engineer |
| S. Scace | Site Vice President |
| J. Semancik | Director, Engineering |
| A. Smith | Asset Management |
| D. Smith | Manager, Emergency Preparedness |
| S. Smith | Manager, Engineering |
| P. Tulba | Radwaste Shipper |
| S. Turowski | Supervisor, Health Physics Technical Services |
| C. Vournazos | IT Specialist, Meteorological Data |

## LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened/Closed

| | | |
|---|---|---|
| 05000423/2012002-01 | NCV | Inadequate Post Maintenance Test Directions following Design Change to 3HVC*FN1B (Section 1R19) |
| 05000336/2012004-02 | NCV | Corrective Action to Prevent Recurrence Ineffective to Preclude Repetition of a Significant Condition Adverse to Quality (4OA3) |

## LIST OF DOCUMENTS REVIEWED

### Section 1R01: Adverse Weather Protection

Procedures
C OP 200.6, Storms and Other Hazardous Phenomena, Revision 002-07
SP 2619A, Control Room Daily Surveillance, Modes 1 and 2, Revision 047-07
MP-28-MET-PRG, Meteorological Monitoring Program, Revision 004-01

Condition Reports
CR484668

### Section 1R04: Equipment Alignment

Procedures
OP 2307-004, Common ECCS Suction Header Valve Alignment, Facility 2, Revision 000-02
OP 2326A-001, SW Alignment Verification, Facility 1, Revision 000-07
OP 3309-001, Quench Spray System (RWST) – Valve Lineup, Revision 005-02
OP 3309-003, Quench Spray System (Train B) – Valve Lineup, Revision 005-04
OP 3326-001, Train 'A' SW System, Revision 009-04
OP 3326-008, EDG 'B' SW System Supply, Revision 004-01
OP 3346A-002, EDG 'B' – Cooling Water Valve Lineup, Revision 007
OP 3346A-004, EDG 'B' – Lube Oil Valve Lineup, Revision 006-02
OP 3346A-006, EDG 'B' - Starting Air Valve Lineup, Revision 009-05
OP 3346A-010, EDG 'B' – Instrument Valve Lineup, Revision 007-01
OP 3346A-012, EDG 'B' Electrical Lineup, Revision 011-03
OPS Form 3346B-2, Valve Lineup for 'B' Diesel Fuel System, Revision 4
HPSI System OP 2308, Revision 012-02
HPSI System Valve Alignment, Facility 1, Revision 000-03
HPSI System Valve Alignment, Facility 2, Revision 000-04

Miscellaneous
System Health Report – HPSI

**Section 1R05: Fire Protection**

Miscellaneous
Millstone Unit 2 Firefighting Strategies, April 2002
Millstone Unit 3 Fire Fighting Strategies, October 2001
MPS3 Fire Protection Evaluation Report, Revision 17.3
U2-24-FPP-FHA, Millstone Unit 2 Fire Hazards Analysis, Revision 12

**Section 1R06: Flood Protection Measures**

Procedures
AOP 2559, Fire, Revision 008
ARP 2590I, Alarm Response for Fire Panel, C-26, Revision 003-05
SP 2618D, Fire Protection System Sprinkler and Deluge Design Function Test, Revision 012-07

Condition Reports
CR408322
CR428232
CR447663
CR454282
CR467125

Miscellaneous
MPS2 Internal Flooding Analysis Flood Induced Initiating Events, Revision 1
25203-24028, Area Drains – Auxiliary Building Plan El. 14'-6" and El. 25'-6", Revision 11

**Section 1R07: Heat Sink Performance**

Condition Reports
CR 375390
CR 404098
CR 428913
CR 432399
CR 452009
CR 488371

Miscellaneous
Heat Exchanger Visual Inspection Tubeside, dated September 17, 2012, ER-AA-HTX-1002, Revision 1
Heat Exchanger Visual Inspection Tubeside, dated May 30, 2012, ER-AA-HTX-1002, Revision 1
Heat Exchanger Visual Inspection Tubeside, dated February 6, 2012, ER-AA-HTX-1002, Revision 1
Root Cause Evaluation RCE001063 Unplanned Shutdown due to SW Leak
SW System Health Report
'C' RBCCW HX D/P Limit Curve
Calculation 03-ENG-04035M2, Revision 0, MP2 SW System Design Basis Summary Calculation

Work Orders
53102374326
53102374325

**Section 1R11: Licensed Operator Requalification Program**

Procedures
OP 2202, Reactor Startup ICCE, Revision 022-02
OP 2203, Plant Startup, Revision 019-08

Miscellaneous
MJUL12TD, Millstone Power Station Unit 3 Rehearsal Training Drill
SP 3623.2, Turbine Overspeed Protection System Test, Revision 009-11

Condition Reports
CR482694
CR482270
CR483664

**Section 1R12: Maintenance Effectiveness**

Procedures
OP 3346C, EGLS Individual Load Testing, Revision 005-02

Miscellaneous
ACE 019064, Received 'A' Train Bypass Annunciator for the Sequencer
ESAS (Sequencer) System Health Report 2nd Quarter 2011 and 2012
ESF Load Sequencer Unavailability July 2010 through June 2012
MRE012191
MRE012281
MRE013775
MRE014861
MRE014941

**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

Procedures
NF-AA-PRA-370, Probabilistic Risk Assessment Procedures and Methods: PRA Guidance for MRule (a)(4)
OP 2271B, Response to Intake Structure Degraded Conditions, Revision 000-05
SP 2654R, Intake Structure Condition Determination, Revision 002-01
WM-AA-100, Work Management, Revision 17
WM-AA-20, Risk Assessment of Maintenance Activities, Revision 1

Condition Reports
CR487415

Miscellaneous
Millstone Unit 2 Shutdown Safety Assessment Checklist, August 15, 2012
NRC Generic Letter 90-05, Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2, and 3 Piping
Temporary Modification 2-12-005, Install Uncoated Piping in 'A' EDG 8" SW Supply, Revision 0
Work Order 53102555638
EOOS Model - change briefing sheet for training
Pre-2R21 shutdown risk schedule review dated September 6, 2012

## Section 1R15: Operability Evaluations

Procedures
OP-AA-102-1001, Development of Technical Basis to Support Operability Determinations, Revision 6
SP3621.3, "Main Feed Pump Trip Logic," Revision 001-06
SP3621.1-001, "Cold Shutdown Test of Feedwater Isolation Valves," Revision 005-04
SP3621.3-001, "Main Feed Pump Trip Logic Testing," Revision 001-01
SP31024, "Calculation of Reactor Trip and ESF Response Times," Revision 006-02

Condition Reports

| | | |
|---|---|---|
| CR-07-07160 | CR480766 | CR484281 |
| CR110811 | CR481401 | CR485149 |
| CR363297 | CR482938 | CR488814 |
| CR478020 | CR483048 | CR489553 |
| CR479294 | CR483637 | CR489277 |
| CR479373 | CR483826 | |

Miscellaneous
25203-20150 Sheet 146, Spent Fuel Pool Cooling Pump Suction, Revision 10
25203-20150 Sheet 150, Spent Fuel Pool Heat Xchr Clrs Outlet Piping, Revision 7
25203-26023 Sheet 2, Spent Fuel Pool Cooling & Cleanup Sys, Revision 31
Reportability Determination for CR485444
Ultrasonic Examination Data Sheets for SW Pipe Supports August 15, 2012
OD000237, Revision 2
ETE-CME-2012-1013, ETE to Support OD000237 (formerly MP3-014-07) Containment Analysis for Feedwater Line Break with FWIV Partially Open, Revision 1
EPRI TR-1032232, EPRI MOV Performance Prediction Program, dated November 1994
NAI-1249-007, Millstone Power Station Unit 3 MSLB Containment Response for Power Uprate using GOTHIC
US(B)-312, Degraded Quench Spray Flow for Containment Integrity Analysis, May 9, 1985
07-ENG-04256M3, Impact of Stretch Power Uprate (SPU) on the Mass and Energy Release rate due to a MFWL Break, November 9, 2008
ETE-CME-2012-1024, Structural Integrity Evaluation of Degraded Flange in 'B' SW Pipe to EDG Spool SK-2963
Ultrasonic Examination Data Sheets for Outlet Flange on Spool SK-2936, September 24-27, 2012

## Section 1R19: Post-Maintenance Testing

Procedures
OP 2346C-002, 'B' DG Data Sheet, Revision 001-09
OP 3346A-013, EDG – Data Sheet, Revision 007-01
OP 3346A-014, EDG 'A' – Operating Log, Revision 012
SP 2602E-001, Pressurizer Heater Capacity Test, Revision 000-00
SP 2604AO-001, 'A' HPSI Pump and Check Valve IST, Revision 001
SP 2612B-003, 'C' SW Pump and Facility 2 Discharge Check Valve IST, Revision 002-08
SP 2613B-001, Periodic DG Operability Test, Facility 2 (Fast Start, Loaded Run), Revision 021-06
SP 2613J-001, 'B' EDG Loss of Load Test, Revision 003
SP 3626.3-001, 3SWP*AOV39A, EDG 'A' SW HX Outlet, Stroke Test, Revision 006-03

SP 3646A.1-001, EDG 'A' Operability Tests, Revision 018-05
SP 3646A.1-003, EDG 'A' Air Start Valves Independence Test, Revision 010
OP-3314F, 'Control Room Ventilation,' Revision 023-00
OP 3353, 'Annunciator System,' Revision 008-03
OP 3353.VP1C 4-1, 'Control BLDG EMER VENT FN SYS 'B' TROUBLE,' Revision 003-07
SP 3614F.1, 'Control Room Emergency Filtration System Operability Test, Revision 006-08
MP3-11-01065, 'MCC Starter Replacement Project – Fifteen Safety Related Starters,' Revision 001 and Revision 002
MP-20-WP-GDL40, 'Pre and Post Maintenance Testing,' Revision 013-03
VPAP-1101, 'Test Control,' Revision 6
VPAP-2003, 'Post Maintenance Testing Program,' Revision 14

Condition Reports

| | | |
|---|---|---|
| CR479760 | CR483972 | CR484287 |
| CR479842 | CR483980 | CR484275 |
| CR480363 | CR484024 | CR485044 |
| CR480372 | CR484047 | CR485348 |
| CR480477 | CR484127 | CR485433 |
| CR482615 | CR484135 | CR482722 |
| CR483962 | CR484136 | CR483890 |
| CR483966 | CR484149 | CR484002 |

Maintenance Orders/Work Orders

| | | |
|---|---|---|
| 53M20506891 | 53102385494 | 53102486553 |
| 53M20703221 | 53102390592 | 53102509899 |
| 53M20704802 | 53102392468 | 53102527277 |
| 53M20802890 | 53102413194 | 53102543253 |
| 53M30714381 | 53102416569 | 53102451547 |

Miscellaneous
25203-32041 Sheets 2A, 16-19, 22, DG 15G-13U Controls, Revisions 10, 9, 6, 7, 9, 8
OD000494, M33EGS*E2B Heat Exchanger End Bells
MP3-11-01065, "MCC Starter Replacement Project – Fifteen Safety Related Starters," Revision 001
ACE019185, "Indications not properly verified during retest of Tech Spec equipment"

**Section 1R20: Refueling and Other Outage Activities**

Procedures
OP 2202, Reactor Startup ICCE, Revision 022-02
OP 2203, Plant Startup, Revision 019-08
SP 2619A-002, Control Room Daily Surveillance, Modes 3 & 4, Revision 034-02

Miscellaneous
25203-26008 Sheet 3, SW to Vital AC Switchgear Cooling Coil and AC Chillers, Revision 32
50.59 Screen, Temporary Modification 2-12-04, Install two high accuracy M&TE digital temperature indication in SW system
Calibration Certificate of Fisher Scientific Digital Thermometers

Condition Reports
CR484692
CR485325
CR485787
CR485800
CR485929
CR485932
CR486019
CR486032
CR486115

**Section 1R22: Surveillance Testing**

Procedures
SP 3609.1-001, Quench Spray Pump 3QSS*P3A Quarterly IST Pump Test, Revision 013-01

Miscellaneous
CR479527
CR487307
CR487310

**Section 1EP6: Drill Evaluation**

Miscellaneous
MJUL12TD, Millstone Power Station Unit 3 Rehearsal Training Drill

Condition Reports
CR482694
CR482270
CR483664

**Section 2RS8: Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation**

Condition Reports
410670; 478437; 443903; 451270; 464913; 465908; 459513; 415395; 447047; 429791; 481884; 394630; 410723; 445903; 465298

Procedures
RW-46041, Revision 006, Compliance with 10 CFR 61 – Waste Classification
MP-27-RW-PRG, Revision 000-01, Radioactive Waste Process Control Program
Radioactive Material Shipments: 11-059; 11-073; 11-098; 12-006; 12-044
WMG, Inc. Courses: RC-102, Use of the WMG Programs and Regulatory Interfaces
RC-300, Air Transportation of Radioactive Materials
Energy Solutions Course: Radioactive Waste Packaging, Transportation, and Disposal Training
NOD Field Observations (NODFOB): 12-023; 12-014; 11-023; 11-016

Miscellaneous
10CFR61 Scaling factor Calculations for: U-2 dry active waste; U-2 L13/L16 filter; U-2 L18 filter; U-2 tri-nuc filter; U-2 resin; U-2 L15 filter; U-3 dry active waste; U-3 resins; U-3 CHS filter; U-3 LWS; U-3 tri-nuc filter; site dry active waste

**Section 4OA1: Performance Indicator Verification**

System Health Report: Unit 2 EDG and Fuel Oil, 2nd quarter 2012
System Health Report: Unit 2 Condensate Storage Tank and Aux Feedwater, 2nd quarter 2012
System Health Report: Unit 2 SW, 2nd quarter 2012
System Health Report: Unit 2 RBCCW, 2nd quarter 2012
System Health Report: Unit 2 High Pressure Safety Injection, 2nd quarter 2012
System Health Report: Unit 2 Containment Spray and RWST, 2nd quarter 2012
System Health Report: Unit 3 EDG and Fuel Oil, 2nd quarter 2012
System Health Report: Unit 3 Containment Recirculation Spray, 2nd quarter 2012
System Health Report: Unit 3 High Head Safety Injection, 2nd quarter 2012
System Health Report: Unit 3 SW, 2nd quarter 2012
Performance Indicator Data – 3rd quarter 2011 to 2nd quarter 2012

Condition Reports

| | | |
|---|---|---|
| CR488325 | CR468157 | MRE014393 |
| CR485568 | CR473464 | MRE014980 |
| CR351300 | MRE013760 | MRE015257 |
| CR468297 | MRE014082 | |
| CR444013 | MRE014245 | |

**Section 4OA2: Problem Identification and Resolution**

Letter: NRC to David Heacock, December 28, 2011, "Millstone Power Station Unit Nos. 2 and 3 – Audit of the Licensee's Management of Regulatory Commitments," (TAC Nos. ME7222 and ME7223)
Dominion Administrative Procedure, "Commitment Management," LI-AA-110, Revision 0
"Millstone Licensing Proofreader Checklist – Outgoing Correspondence"
CA219519, "Licensing – EVAL, address Regulatory Commitments Note Entered into RCD," November 16, 2011
CA223694, "Revise Procedure LL-AA-200, "NRC Licensing Correspondence," January 12, 2012
CA223713, "Convert Regulatory Commitment Database from "ACCESS" to "Teamtrack LC Module," January 12, 2012
CA205832, "Change Commitment," July 6, 2011
CR452855, "Annual Commitment Change Summary Report Not Submitted," November 15, 2011
CR432849, "Report exemption not needed, revising commitment," June 30, 2011
RCR-43007, "Replace downstream flange on Spool Piece 2952," August 19, 2011
RCR-43008, "Leakage and UT monitoring will be performed on 'A' Service Header leakage," August 19, 2011
RCR-43009, "Summary of evaluations submittal per power uprate RAI EEEB-07-0052," January 10, 2008
RCR-43010 "Design Change to insulate motor operators," August 19, 2011
RCR-43011, "Revise FSAR Chapters 7 and 15," April 24, 2008
RCR-43012, "Provide responses to RAI questions," March 5, 2009
RCR-43013, "Update to MPS3 stretch power uprate license amendment request," May 20, 2008

**Section 4OA3: Followup of Events and Notices of Enforcement Discretion**

Condition Reports
CR437224

Procedures
PI-AA-200, Corrective Action, Revision 20

Miscellaneous
RCE 001044, Root Cause Evaluation: Unplanned 8 percent Reactor Power Excursion, Millstone Unit 2 (CR413602)
RCE 001057, Root Cause Evaluation: Unit 2 Trip Due to Low Suction Pressure Trip of B-SGFP, Millstone Unit 2 (CR431754)
RCE 001073, Root Cause Evaluation: Millstone Unit 3 Allowable Temperature Low Out of Band on Reactor Startup, Millstone Unit 3 (CR453799)
NRC Inspection Report: Millstone Unit 2 – NRC Special Inspection Report 05000336/2011008; Preliminary White Finding (ML11470484)
NRC Letter EA-11-047, "FINAL SIGNIFICANCE DETERMINATION FOR A WHITE FINDING, WITH ASSESSMENT FOLLOW-UP; NOTICE OF VIOLATION; AND RESULTS OF REGULATORY CONFERENCE [NRC SPECIAL INSPECTION REPORT NO. 055000336/2011010] – MILLSTONE POWER STATION UNIT 2" (ML112200394), dated August 8, 2011

**Section 4OA5: Other Activities**

Condition Reports
CR408526
CR409418
CR434798
CR435592

Engineering Technical Evaluations
Engineering Technical Evaluation, ETE-CME-2012-1007, Revision 0, Evaluation of Millstone Unit 2 Buried SW Supply (24"-KE-1)
Engineering Technical Evaluation, ETE-CME-2011-1004, Revision 3, dated August 3, 2011

Repair/Replacement Plans
American Society of Mechanical Engineers (ASME) Section XI Repair/Replacement Plan - Fabricate Replacement Spool SK-3650 for Line 8"-JGD-7 iaw MP2-10-01196-000, dated December 19, 2010

Operability Determinations
Prompt Operability Determination 000432, August 9, 2011; MP2 EDG SW Discharge Common Header
OD 000429
OD 000432

Engineering Procedures
Millstone Power Station Engineering Procedure, EN21154A, Revision 002-06, Tank Inspection Plan, July 26, 2011
Millstone Power Station Engineering Procedure, EN31154, Revision 003-00, Tank Inspection Plan, February 23, 2012

Drawings
Dominion drawing SKS-ASK-UNDGNDSOIL: MILLSTONE-SITE UNDERGROUND PIPING MAP SOIL ACQUISITION LOCATIONS

Program Documents

Millstone Power Station Life Cycle Management Plan Underground Pipe and Tank Inspection Program, June 11, 2012

Dominion Nuclear Fleet Program Description, ER-AA-BPM-10, Revision 2: Underground Piping and Tank Integrity Description

Dominion Nuclear Fleet Administrative Procedure, ER-AA-BPM-101, Revision 3: Underground Piping and Tank Integrity Program

EPRI, Buried Pipe Guided Wave Examination Reference Document, 1019115, October 2009

EPRI, BP Works Software User's Manual, Risk Ranking of Buried Piping Systems, Software Product ID: 1091178, April 2009

EPRI, Recommendations for an Effective Program to Control the Degradation of Buried and Underground Piping and Tanks (1016456, Revision 1), 2010 Technical Report

Dominion Nuclear Fleet Nondestructive Examination Procedure, ER-AA-NDE-UT-175, Revision 0; Procedure for the Application of Ultrasonic Guided Wave Examination Techniques for Piping Systems, September 12, 2011

SAR 001156, Buried Piping and Risk Ranking Self Assessment, July 15, 2011

Miscellaneous Documents

NRC TI 2515/182, November 17, 2011; Review of the Implementation of the Industry Initiative to Control Degradation of Underground Piping and Tanks

NEI 09-14 [Revision 1], December 2010; Guideline for the Management of Underground Piping and Tank Integrity

## LIST OF ACRONYMS

| | |
|---|---|
| ACE | apparent cause analysis |
| ADAMS | Agencywide Documents Access and Management System |
| CAP | Corrective Action Program |
| CBI | control building isolation |
| CFR | Code of Federal Regulations |
| CR | condition reports |
| DRP | Division of Reactor Projects |
| DRS | Division of Reactor Safety |
| EDG | emergency diesel generator |
| ECCS | emergency core cooling system |
| EP | emergency preparedness |
| ESAS | emergency safeguard actuation system |
| FSAR | final safety analysis report |
| HPSI | high pressure safety injection |
| IMC | Inspection Manual Chapter |
| IST | in-service test |
| LER | licensee event report |
| MSPI | mitigating system performance index |
| NCV | non-cited violation |
| NEI | Nuclear Energy Institute |
| NRC | Nuclear Regulatory Commission |
| OOS | out of service |
| PARS | Publicly Available Records |
| PCP | process control program |
| PD | performance defciency |
| PMT | post maintenance testing |
| QA | quality assurance |
| QSS | quench spray system |
| RBCCW | reactor building component cooling water |
| RCE | root cause evaluation |
| RHR | residual heat removal |
| SDP | Significance Determination Process |
| SSC | structure, system, or component |
| SW | service water |
| TI | temporary instruction |
| TS | technical specifications |
| UFSAR | Updated Final Safety Analysis Report |

**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
**REGION I**
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

November 2, 2012

Mr. David Heacock
President and Chief Nuclear Officer
Dominion Resources
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE GENERATING STATION - NRC SUPPLEMENTAL INSPECTION REPORT 05000336/2012011 AND ASSESSMENT FOLLOW-UP LETTER

Dear Mr. Heacock:

On September 13, 2012, the U. S. Nuclear Regulatory Commission (NRC) completed a supplemental inspection pursuant to Inspection Procedure (IP) 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area," at your Millstone Power Station, Unit 2. The enclosed inspection report (IR) documents the inspection results, which were discussed on September 13, 2012, with members of your staff.

As required by the NRC Reactor Oversight Process Action Matrix, this supplemental inspection was conducted because a finding of low to moderate safety significance (White) was identified in the second quarter of 2011. This issue was documented previously in NRC Inspection Report 05000336/2011008, dated May 27, 2011, and involved the failure of Millstone Unit 2 personnel to carry out their assigned roles and responsibilities and to effectively manage reactivity during main turbine control valve testing on February 12, 2011, as well as the failure to have appropriate guidance in procedures to address multiple reactivity additions. A regulatory conference was held on July 19, 2011 and finalized the significance of this issue. The results of the regulatory conference were conveyed to you in a letter dated August 8, 2011, “FINAL SIGNIFICANCE DETERMINATION FOR A WHITE FINDING, WITH ASSESSMENT FOLLOW-UP; NOTICE OF VIOLATION; AND RESULTS OF REGULATORY CONFERENCE [NRC SPECIAL INSPECTION REPORT NO. 05000336/2011010 – MILLSTONE POWER STATION UNIT 2.” (ML112200394) The NRC staff was informed on August 2, 2012, of your staff’s readiness for this supplemental inspection.

The objectives of this supplemental inspection were to provide assurance that: (1) the root causes and the contributing causes for the risk-significant issues were understood; (2) the extent of condition and extent of cause of risk significant performance issues were identified; and (3) corrective actions for risk significant performance issues are sufficient to address the root and contributing causes and prevent recurrence. The inspection consisted of examination of activities conducted under your license as they related to safety, compliance with the Commission’s rules and regulations, and the conditions of your operating license. The NRC concluded that, overall, the inspection objectives were met. However, one new performance issue concerning the effectiveness of your corrective actions to prevent recurrence for the event’s root cause was identified and will be dispositioned in the 2012 third quarter integrated inspection report (05000336/2012004 and 05000423/2012004). In addition, several observations regarding the extent of condition and timeliness and quality of Dominion’s corrective actions were noted. Taken collectively, these observations were not considered

significant weaknesses in that they did not represent a substantial inadequacy in Dominion's evaluation of the causes of the performance issue, determination of the extent of the performance issue, or actions taken or planned to correct it.

Based on the guidance in IMC 0305, "Operating Reactor Assessment Program," and the results of the inspection, the White finding will be closed and Millstone Power Station Unit 2 will transition from the Regulatory Response Column of the NRC's Action Matrix to the Licensee Response Column as of the date of this letter.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/***RA***/

Ronald R. Bellamy, Chief
Projects Branch 5
Division of Reactor Projects

Docket No.: 50-336
License No.: NPF-65

Enclosure: Inspection Report 05000336/2012011
w/Attachment: Supplementary Information

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significant weaknesses in that they did not represent a substantial inadequacy in Dominion's evaluation of the causes of the performance issue, determination of the extent of the performance issue, or actions taken or planned to correct it.

Based on the guidance in IMC 0305, "Operating Reactor Assessment Program," and the results of the inspection, the White finding will be closed and Millstone Power Station Unit 2 will transition from the Regulatory Response Column of the NRC's Action Matrix to the Licensee Response Column as of the date of this letter.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/***RA***/

Ronald R. Bellamy, Ph. D., Chief
Projects Branch 5
Division of Reactor Projects

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| OFFICE | RI/DRP | RI/DRP | RI/DRP | RI/DRP | RI/DRP |
| NAME | JKulp/via phone | RBellamy | | | |
| DATE | 10/28/12 | 11/02/12 | | | |

OFFICIAL RECORD COPY

U.S. NUCLEAR REGULATORY COMMISSION (NRC)

REGION I

| | |
|---|---|
| Docket No.: | 50-336 |
| License No.: | DPR-65 |
| Report No.: | 05000336/2012011 |
| Licensee: | Dominion Nuclear Connecticut, Inc. |
| Facility: | Millstone Power Station, Unit 2 |
| Location: | P.O. Box 128<br>Waterford, CT 06385 |
| Dates: | September 10, 2012 through September 13, 2012 |
| Inspectors: | J. Kulp, Senior Resident Inspector, Lead Inspector<br>T. Hedigan, Operations Engineer |
| Approved by: | Ronald R. Bellamy, Chief<br>Projects Branch 5<br>Division of Reactor Projects |

## SUMMARY OF FINDINGS

IR 05000336/2012011; 9/10/2012 – 9/13/2012; Millstone Power Station, Unit 2; Supplemental Inspection – Inspection Procedure (IP) 95001

A Region I senior resident inspector and an operations engineer from Region I, Division of Reactor Safety performed this inspection. One new performance issue was identified during this inspection. In accordance with NRC IP 95001, this issue will be dispositioned in the Millstone resident inspector quarterly report using the appropriate baseline inspection.

### NRC-Identified and Self-Revealed Findings

**Cornerstone: Initiating Events**

The NRC staff performed this supplemental inspection in accordance with IP 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area," to assess Dominion's root cause evaluation and corrective actions taken in response to an unintended 8 percent reactor power transient (88 percent to 96 percent) during performance of quarterly main turbine control valve testing in Millstone Unit 2 on Saturday, February 12, 2011. The NRC staff previously characterized this issue as having low to moderate safety significance (White), as documented in NRC Inspection Report 05000336/2011008 (ML111470484). The significance determination was finalized in an August 8, 2011 letter from the NRC to Mr. D. Heacock, President and Chief Nuclear Officer of Dominion Nuclear Connecticut, Inc, "FINAL SIGNIFICANCE DETERMINATION FOR A WHITE FINDING, WITH ASSESSMENT FOLLOW-UP; NOTICE OF VIOLATION; AND RESULTS OF REGULATORY CONFERENCE [NRC SPECIAL INSPECTION REPORT NO. 05000336/2011010 – MILLSTONE UNIT 2." (ML112200394)

Dominion identified the root cause of the issue as: "The crew performance management program was ineffective in correcting observed Unit 2 crew performance deficiencies. This program was informal, not consistently implemented and did not achieve the desired results."

As documented in NRC Inspection Report 05000336/2011008 (ML111470484), the special inspection team reviewed the root cause evaluation and concluded that the root cause evaluation was thorough and the associated proposed corrective actions appeared to adequately address the underlying casual factors. In the period between the completion of the special inspection in April 2011 and the supplemental inspection in September 2012, Dominion had two additional relevant events (June 2011 and November 2011) involving human performance, that provided additional data to assess the effectiveness of corrective actions taken for the February 2011 event. The November 2011 event was determined by Dominion to be a repeat of the event of February 2011, with the exception that the event occurred in Unit 3. Based on the results of this inspection, the inspectors concluded that, in general, Dominion had adequately performed a root cause evaluation of the February 2011 event. Additionally, the inspectors concluded that the combined effect of the completed and planned corrective actions taken in regards to the three events (February, June and November 2011) were reasonable to address the related performance issues. The inspectors identified one new performance issue and several observations. These observations were not considered significant in that they did not represent a substantial inadequacy in Dominion's evaluation of the causes of the performance issue, determination of the extent of the performance issue, or actions taken or planned.

As a result of this supplemental inspection, in accordance with the guidance in IMC 0305, "Operating Reactor Assessment Program," the white finding associated with the February 2011 event is closed and Dominion will transfer to the Licensee Response Column of the NRC's action matrix as of the date of the cover letter to this report. One new performance issue was identified during this inspection. In accordance with NRC IP 95001, this issue will be dispositioned in the Millstone resident inspector quarterly report using the appropriate baseline inspection.

**Other Findings**

No findings were identified.

## REPORT DETAILS

## 4. OTHER ACTIVITIES

4OA4 Supplemental Inspection (95001)

.01 Inspection Scope

The NRC staff performed this supplemental inspection in accordance with IP 95001 to assess Dominion's evaluation of a White finding, which affected the Initiating Events cornerstone in the Reactor Safety strategic performance area. The inspection objectives were:

- To provide assurance that the root causes and contributing causes of risk-significant performance issues are understood
- To provide assurance that the extent of conditions and extent of cause of risk-significant performance issues are identified
- To provide assurance that the licensee's corrective actions for risk-significant performance issues are sufficient to address the root and contributing causes and prevent recurrence

On Saturday, February 12, 2011, Millstone Unit 2 experienced an unintended 8 percent reactor power transient (88 percent to 96 percent) during performance of quarterly main turbine control valve testing. In accordance with Inspection Manual Chapter 0309, a special inspection team was chartered on February 18, 2011 to evaluate operator performance and organizational decision-making. Dominion entered this event into the corrective action program as CR413602 and performed a root cause evaluation of the event. Dominion's root cause evaluation, RCE 001044, "Unplanned 8% Reactor Power Excursion," identified one root cause, one corrective action to prevent recurrence and several contributing causes for this event.

The special inspection took place from February 22, 2011 through April 14, 2011 and the results were documented in Inspection Report 05000336/2011008 (ML111470484). A self-revealing finding with a preliminary low to moderate safety significance (preliminary White) was identified. The finding was associated with the failure of Millstone Unit 2 personnel, including licensed Reactor Operators and Senior Reactor Operators, to carry out their assigned roles and responsibilities and to effectively manage reactivity during main turbine control valve testing on February 12, 2011. Additionally, Dominion had not established written procedures for the reactor protection system variable high-power trip, and for power operation and transients involving multiple reactivity additions. The finding was characterized as having low to moderate (White) safety significance based on the criteria contained in IMC 0609, Appendix M, "Significance Determination Process Using Qualitative Criteria."

At Dominion's request, a regulatory conference was held on July 19, 2011, at the NRC's Region I office in King of Prussia, Pennsylvania. The results of the regulatory conference were documented in an August 8, 2011 letter from the NRC to Mr. D. Heacock, President and Chief Nuclear Officer of Dominion Nuclear Connecticut, Inc, "FINAL SIGNIFICANCE DETERMINATION FOR A WHITE FINDING, WITH ASSESSMENT FOLLOW-UP; NOTICE OF VIOLATION; AND RESULTS OF REGULATORY CONFERENCE [NRC SPECIAL INSPECTION REPORT NO. 05000336/2011010] – MILLSTONE UNIT 2." (ML112200394). The final significance of the preliminary White finding from the special inspection was confirmed to

be White. Additionally, Millstone Unit 2 entered the Regulatory Response Column of the NRC's Action Matrix on August 8, 2011 as a result of one inspection finding of low to moderate (White) safety significance.

Although not the subject of this supplemental inspection, Millstone Power Station experienced two other events that are pertinent to this inspection. On June 20, 2011, during a planned start of the second steam generator feed pump at Unit 2, a low suction pressure trip of the running steam generator feed pump occurred, resulting in a reactor trip due to low steam generator water level. This event was entered into Dominion's corrective action program as CR431754 and root cause evaluation RCE 001057 was performed to determine the root and contributing causes of this event. On November 23, 2011, Millstone Unit 3 experienced an unintended 6 percent reactor power transient (25 percent to 33 percent) during performance of main turbine control valve testing. This event was entered into Dominion's corrective action program as CR435799 and root cause evaluation RCE 001073 was performed to determine the root and contributing causes of this event. The inspectors reviewed these root cause evaluations to look for trends in operator performance and as an input to assess the adequacy of the corrective actions taken in response to the February 2011 event in Millstone Unit 2.

Dominion performed a readiness review in December 2011 to assess the station's readiness for a 95001 inspection for the February 2011 event. The results were documented in SAR001631, "Formal Self Assessment, 95001 Readiness Review, RCE0001044 Unplanned 8% Reactor Power Excursion at Millstone Unit 2." The review identified that in some cases the corrective actions associated with the February 2011 event were not complete and/or had not been effective in improving operator performance. The review identified areas for improvement to prepare Dominion for a 95001 inspection. Dominion entered the results of the review into the corrective action program as CRs 474770, 475078 and 476298.

Dominion conducted a root cause evaluation effectiveness review for the February 2011 event in May 2012. The results of the effectiveness review were documented in ERF000343. The results concluded that, following the November 2011 event, the corrective actions for the February 2011 event were effective. However, the review also concluded that additional time was required for Dominion's operations staff to demonstrate sustained performance improvement and recommended that another readiness review be conducted in 6 to 9 months to confirm effectiveness of the corrective actions identified for the February 2011 event.

Dominion Nuclear Oversight performed an assessment of the station's readiness for a 95001 inspection in June 2012. The results were documented in Nuclear Oversight Assessment 12-42-M, "NRC 95001 Inspection Readiness." The report concluded that the readiness for the 95001 inspection was improving, that the crew performance monitoring program was not fully implemented as described in the corrective actions to the February 2011 event, and recommended several actions to improve readiness.

Dominion staff informed the NRC staff on August 2, 2012 that they were ready for the supplemental inspection.

The inspectors reviewed Dominion's root cause evaluations for the three events, reviewed applicable corrective action program documents, interviewed operations crew personnel, observed a crew performance review meeting, and reviewed crew performance indicators. The inspectors also held discussions with licensing and operations management personnel to

ensure that the root and contributing causes were understood and corrective actions taken or in progress were appropriate to address the identified causes and to prevent recurrence of the original issue.

.02 Evaluation of the Inspection Requirements

02.01 Problem Identification

*a. IP 95001 requires that the inspection staff determine that the licensee's evaluation of the issue documents who identified the issue (i.e., licensee-identified, self-revealing, or NRC-identified) and the conditions under which the issue was identified.*

The inspectors noted that while Dominion's root cause evaluation did not explicitly identify who identified the issue, it does provide sufficient detail on how the issue developed to determine that the issue was self-revealing. NRC IP 612, paragraph 3.17 defines self revealing and states, in-part:

> "Self revealing findings or violations are those developed form issues that become self-evident and require no active and deliberate observation by the licensee or NRC inspectors to determine whether a change in process or equipment capability or function has occurred. Self revealing issues become readily apparent to either NRC or licensee personnel through a readily detectable degradation in the material condition, capability, or functionality of equipment or plant operations and require minimal analysis to detect. Examples of self revealing findings and violations include those revealed through: reactor trips and secondary plant transients…."

Specifically, section 2.2.1, "Event Investigation" of the root cause evaluation describes and presents graphical representations of reactor power that show a clear power excursion due to a secondary plant transient.

Overall, the inspectors determined that Dominion's root cause evaluation effectively documents who identified the issue and the conditions under which the issue was identified.

*b. IP 95001 requires that the inspection staff determine that the licensee's evaluation of the issue documents how long the issue existed and prior opportunities for identification.*

Dominion does not explicitly state how long the operator performance issue existed. The root cause evaluation documents a "repeat event review" and a review of internal and external operating experience. A similar event in 2007, concerning a power increase during turbine throttle valve testing was identified, but the cause was identified to be a material failure and not an operator performance issue. No other similar issues were identified. One internal operating experience document, RCE0001937 "Reactor Trip Due to Circ Pump Operation," was identified as documenting similar operator behavior issues such as those being evaluated in the February 2011 event. Section 2.3, "Extent of Condition" documents that a 2009 Six Sigma project identified "significant advocacy issues" with Unit 2 operations personnel which corroborates the root cause of the February 2011 event.

Overall, the inspectors determined that Dominion's root cause evaluation effectively documents that the operator performance issue had existed for several years and documented prior opportunities for identification.

c. *IP 95001 requires that the inspection staff determine that the licensee's evaluation documents the plant specific risk consequences, as applicable, and compliance concerns associated with the issue(s).*

Dominion's root cause evaluation documents the safety consequences of this event. The licensee concluded that in this case the actual core flux distribution remained bounded by the safety analysis and the actual safety consequences are negligible. However, resetting the variable high power trip offset and manually withdrawing control element assemblies have the potential to result in an event outside the bounds of the existing Final Safety Analysis Report Chapter 14 accident analysis.

Overall, the inspectors determined that Dominion's evaluation documented the plant specific risk consequences and compliance concerns associated with the issue.

d. Findings

No findings were identified

02.02 Root Cause, Extent of Condition, and Extent of Cause Evaluation

a. *IP 95001 requires that the inspection staff determine that the licensee evaluated the issue using a systematic methodology to identify the root and contributing causes*

Dominion used the following systematic methods to complete the root cause evaluation: Comparative Timeline, Barrier Analysis and Why Staircase. Dominion identified one root cause, and eight contributing causes. Dominion determined the root cause of the event to be:

> "The crew performance management program was ineffective in correcting observed Unit 2 crew performance deficiencies. The program was informal, not consistently implemented and did not achieve the desired results."

The inspectors determined that Dominion had evaluated the issue using a systematic methodology to identify root and contributing causes.

b. *IP 95001 requires that the inspection staff determine that the licensee's root cause evaluation was conducted to a level of detail commensurate with the significance of the issue.*

Dominion's root cause evaluation included the use of a combination of root cause assessment methods that are complimentary. A collective review of the root and contributing causes did not result in the identification of any additional fundamental issues.

The inspectors observed that, in several cases, an identified cause of an issue was general and not specific and did not reflect an effective use of the "why staircase" method. In the use of the "why staircase", the evaluation team should continue to ask "why" until a cause beyond Dominion's control was reached. The following two examples illustrate where the "Why" staircase could have been continued to determine a more definitive cause.

- Root cause. The Dominion root cause evaluation team identified the root cause of the February 2011 event as:

> "The crew performance management program was ineffective in correcting observed Unit 2 crew performance deficiencies. The program was informal, not consistently implemented and did not achieve the desired results."

If the Dominion root cause evaluation team asked why "the crew performance management program was ineffective," they may have identified that "operations supervision has been ineffective in demonstrating, communicating and holding personnel accountable to the importance of using required standards to perform operational activities." This is the root cause of the November 2011 event, which was a repeat of the February 2011 event (the subject of this inspection). This, in turn, may have led to an earlier start in correcting operator behaviors and prevented the recurrence of the February 2011 event in November 2011.

- Contributing cause. Contributing cause 8 is identified, in part, as:

> "Procedure SP 2615N did not identify termination criteria, or 1st stage press manipulation."

That is where the why staircase ends, and this is contributing cause eight. If Dominion asked why the procedure did not have termination criteria, they may have found other causes, such as gaps in procedural or technical review processes that were not identified. Continuing to ask why until the causes are beyond the licensee's control gives more confidence that all of the root and contributing causes have been found.

Despite these observations, the inspectors determined that the licensees' root cause evaluation was generally conducted to a level of detail commensurate with the significance of the issue.

c. *IP 95001 requires that the inspection staff determine that the licensee's root cause evaluation included a consideration of prior occurrences of the issue and knowledge of Operating Experience.*

Dominion's root cause evaluation included an evaluation of internal and external operating experience. Dominion also did a review for similar occurrences of this event at Millstone and did not identify any events that had the same causal factors.

Overall, the inspectors determined that Dominion's root cause evaluation included a consideration of prior occurrences of the issue and knowledge of operating experience.

d. *IP 95001 requires that the inspection staff determine that the licensee's root cause evaluation addresses the extent of condition and extent of cause of the issue.*

Extent of condition. Dominion's root cause evaluation addressed the extent of condition for the event. The condition identified was:

> "Operator actions added positive reactivity during the transient. Operators increased turbine load, lowered condenser steam dump set point, withdrew control rods, and reset the variable high power trip set point during the transient."

The object of the condition was initially identified as Unit 2 Control Room Delta Crew. The root cause evaluation team further determined that, based upon analysis of the data reviewed, the condition extended to all Unit 2 crews. They also stated that initial reviews of Unit 3 training data did not reveal the same level of weakness. They recommended that a more detailed review of training and observation data was needed; and created a contributing cause corrective action (CCCA11) to perform an extent of condition review of unit 3 crew performance using available observation and training information, and initiate actions as needed, to address identified shortfalls. By creating a contributing cause corrective action to perform this assessment, the performance analysis of the Unit 3 crews was not captured as part of the root cause evaluation process and was transferred to the corrective action program. Further corrective actions were taken in response to the Unit 3 crew performance analysis. Ultimately, all corrective actions are being performed for both Unit 2 and Unit 3; therefore the inspectors determined that the extent of condition for the operator performance issues was adequate.

An objective of IP 95001 is to provide assurance that the extent of condition and extent of cause of risk significant performance issues are identified. The Notice of Violation contained two violations associated with the White finding. The first violation is contained in paragraph A of the Notice of Violation and details the performance issues associated with the February 2011 event. Millstone determined that the extent of condition for this violation was at both Unit 2 and Unit 3.

The second violation is contained in paragraph B of the Notice of Violation and details a violation of technical specification 6.8 “Procedures” for not having written procedures as recommended in Appendix A of Regulatory Guide 1.33, “Quality Assurance.” The root cause evaluation extent of condition did not specifically address the extent of condition for not having adequate procedures. This violation cited two specific examples.

- First, Millstone had no procedural guidance for resetting the variable high power trip. The variable high powered trip is a unique design feature of Unit 2 and is not a feature of Unit 3. However, there was no extent of condition that questioned whether there are other activities that Millstone performs at either unit without procedural guidance that should have procedural guidance.

- Second, Millstone’s procedures lacked guidance for multiple concurrent additions of positive reactivity. Although the extent of condition did not address which procedures needed this guidance, two corrective actions were generated which revised the corporate procedure for reactivity management and did a review of all secondary side procedures that affected reactivity to add precautions concerning multiple reactivity additions. The extent of condition concerning the reactivity issue was adequately addressed through these corrective actions.

Overall, the inspectors determined that the initial extent of condition was generally weak, due to not explicitly addressing the extent of condition for all risk significant performance issues that were identified in the notice of violation. The corrective actions generated by Dominion’s root cause evaluation offset the weaknesses observed in the extent of condition evaluation and ultimately the extent of condition was adequate.

Extent of Cause. The root cause evaluation team considered the extent of cause associated with the root cause and determined that the cause was potentially applicable to

the Station Emergency Response and Security organizations. Both organizations rely heavily on crews working effectively together during a wide variety of circumstances. The root cause evaluation team also did an extent of cause for contributing cause 8; “Control valve test procedure needs improvement,” which resulted in a corrective action to revise the Unit 3 control valve test procedure based on the extent of cause review. Overall, the inspectors determined that Millstone’s root cause evaluation addressed the extent of cause of the issue.

*e. IP 95001 requires that the inspection staff determine that the licensee’s root cause, extent of condition, and extent of cause evaluations appropriately considered the safety culture components as described in IMC 0305.*

Dominion considered the safety culture aspects of Decision Making, Resources, Work Practices, Operating Experience, Self and Independent Assessments and Organizational Change Management to be applicable to this issue. Corrective actions have been completed taking into consideration the input of the safety culture aspects.

Overall, the inspectors determined the root cause evaluation included a proper consideration of whether the root cause, extent of condition, and extent of cause evaluations appropriately considered the safety culture components.

f. Findings

No findings were identified.

02.03 Corrective Actions

*a. IP 95001 requires that the inspection staff determine that (1) the licensee specified appropriate corrective actions for each root and/or contributing cause, or (2) an evaluation that states no actions are necessary is adequate.*

The root cause evaluation documents corrective actions for the root cause, contributing causes and corrective actions for other issues. The inspectors reviewed all of the corrective actions to ensure that they addressed the identified causes. The inspectors found the completed and proposed corrective actions to be reasonable with regard to addressing the performance deficiencies identified with this event.

Overall, the inspectors found that Dominion specified appropriate corrective actions for the root cause, contributing causes, extent of condition, and extent of cause.

*b. IP 95001 requires that the inspection staff determine that the licensee prioritized corrective actions with consideration of risk significance and regulatory compliance.*

The inspectors reviewed the prioritization of the corrective actions and verified that the prioritization was based on consideration of risk significance and regulatory compliance. At the time of this inspection, all corrective actions were closed with one exception. The corrective action to revise Millstone 3 operating procedures to incorporate specific reactivity management guidance has not been completed and is awaiting implementation of the revised guidance into the existing procedures.

Paragraph B of the Notice of Violation states, in part, "…Specifically, during the unplanned reactor power increase, Millstone Unit 2 operators implemented three additional positive reactivity additions…, and there was no procedural guidance regarding the concurrent execution of these activities."

To address this portion of the Notice of Violation, Millstone generated two corrective actions and both were assigned a low priority. The first corrective action was to develop guidance in OP-AP-300, "Reactivity Management" for control of multiple reactivity additions during steady state operations. This corrective action was completed in a timely manner on September 26, 2011, when the corporate reactivity management procedure was put into effect. The second corrective action was to review secondary plant equipment guidance and revise the guidance to provide stronger reactivity management guidance where applicable. The second corrective action is only partially complete at the time of this inspection. The majority of Unit 2 procedures were revised in July of 2012 and none of the Unit 3 procedures have been completed.

Overall the inspectors determined that Dominion had established an appropriate schedule for implementing and completing the majority of the corrective actions with the exception of the procedures for addressing multiple reactivity additions.

c. *IP 95001 requires that the inspection staff determine that the licensee established a schedule for implementing and completing the corrective actions.*

Dominion's corrective actions and proposed corrective action plan provided dates for completion of actions as described in the root cause evaluation. Overall, the inspectors determined that the dates were reasonable with the exception of revising the operating procedures addressing the multiple reactivity additions, which is discussed in paragraph b. above.

d. *IP 95001 requires that the inspection staff determine that the licensee developed quantitative and/or qualitative measures of success for determining the effectiveness of the corrective actions to prevent recurrence.*

The inspectors determined that the root cause evaluation included an effectiveness review for the corrective action to prevent recurrence. The effectiveness review was completed in May, 2012. In November 2011, a repeat event of the February 2011 event occurred in Unit 3. Dominion performed a root cause evaluation for the November 2011 event (RCE 1073, MP3 Allowable Temperature Low out of Band on Reactor Startup) which documented as a contributing cause the fact that operations failed to effectively implement the corrective action to prevent recurrence of the February 2011 event. During the performance of the May 2012 effectiveness review, Dominion acknowledged that the corrective actions were not effective prior to November 2011 and used the time period of December 2011 to May 2012 as basis for determining effectiveness. The effectiveness review using qualitative indicators determined that the combined corrective actions have been effective.

Overall, the inspectors determined that after implementing the corrective actions from events occurring in February, June and November 2011, the licensee has successfully performed an effectiveness review of the corrective actions.

The inspectors identified a new performance issue concerning the adequacy of the corrective actions to prevent recurrence for the February 2011 event and the actual occurrence of a repeat event in Unit 3 in November 2011. The guidance in IP 95001 directs new performance issues be inspected using appropriate baseline inspection procedures. This issue will be dispositioned

in the NRC integrated inspection report for the third quarter of 2012 (05000336/2012004 and 05000423/2012004).

e. *IP 95001 requires that the inspection staff determine that the licensee's planned or taken corrective actions adequately address a Notice of Violation (NOV) that was the basis for the supplemental inspection, if applicable.*

The results of the regulatory conference and the Notice of Violation are documented in an August 8, 2011 letter from the NRC to Mr. D. Heacock, President and Chief Nuclear Officer of Dominion Nuclear Connecticut, Inc, "FINAL SIGNIFICANCE DETERMINATION FOR A WHITE FINDING, WITH ASSESSMENT FOLLOW-UP; NOTICE OF VIOLATION; AND RESULTS OF REGULATORY CONFERENCE [NRC SPECIAL INSPECTION REPORT NO. 05000336/2011010] – MILLSTONE UNIT 2." (ML112200394). The letter concluded that information regarding: (1) the reason for the violations; (2) the actions planned or already taken to correct the violations and prevent recurrence; and (3) the date when full compliance was achieved, were already adequately addressed on the docket in NRC Inspection Report 05000336/2011008 and in the information Dominion provided at a regulatory conference conducted on July 19, 2011.

f. Findings

No findings were identified.

02.04 Evaluation of IMC 0305 Criteria for Treatment of Old Design Issues

This part of IP 95001 was not implemented as Dominion did not request credit for self-identification of an old design issue and the finding did not meet the requirements of IMC 0305 paragraph 04.18 for consideration as an old design issue.

4OA6 Exit Meeting

On September 13, 2012, the inspectors presented the inspection results to Mr. M. Adams, Plant Manager, and other members of his staff, who acknowledged the results.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## SUPPLEMENTAL INFORMATION

## KEY POINTS OF CONTACT

Licensee Personnel
M. Adams, Plant Manager
R. MacManus (Director of Licensing
K. Grover (Ops Manager)
A. Bassham (Manager Organizational Effectiveness)
J. Semancik (Engineering Director)
T. Cleary, Licensing
H. McKenney, Operations
J. Brown, Senior Reactor Operator
M. Gagnon, Reactor Operator
S. Kwan, Senior Reactor Operator
R. Schmidt, Reactor Operator
B. Gayneir, Shift Manager
T. Berger, Shift Manager

## LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Closed

| | | |
|---|---|---|
| 05000336/2011008-01 | NOV | Multiple Examples of Procedural Violations and Inadequate procedures Relating to Control Room Crew Performance During a Plant Transient |

## LIST OF DOCUMENTS REVIEWED

Procedures
OSSI-12-004, Crew Performance Discussions at Mid-Shift Briefs, Revision 0
MPS-12-001, On-Shift Mentoring, Revision 2
MPS-12-003, Quarterly Shift Manager Meeting, Revision 0
PI-AA-100, Performance Monitoring, Revision 4
PI-AA-100-1003, Self Evaluation, Revision 10
PI-AA-5002, Observation and Coaching, Revision 2
OP-AA-10, Conduct of Operations, Revision 0
OP-AA-100, Conduct of Operations, Revision 21
AD-AA-10, Administrative Controls Program, Revision 1
OP-AA-1800, Operator Fundamentals, Revision 4
PI-AA-5000, Human Performance, Revision 7
OP-AA-500, Conduct of Shift Technical Advisor, Revision 4
PI-AA-200-2002, Effectiveness Reviews, Revision 5
PI-AA-5001, Human Performance (HU) Event-Free Day Clocks, Revision 6
OP-AP-300, Reactivity Management, Revision 14
DOM-QA-1, Dominion Nuclear Facility Quality Assurance Program Description, Revision 13
PI-AA-200, Corrective Action, Revision 20
AOP 2584, Turbine valve Failure, Revision 000-01

ARP 2590D-022, Atmospheric Dump Valve Not Closed, Revision 000-04
ARP2590D-023, Condenser Steam Dump Valve Not Closed, Revision 000-02
ARP2590D-024, Condenser Bypass Valve Not Closed, Revision 000-03
ARP2590C-110, CEA Withdraw Prohibit, Revision 000
ARP2590C-148, Tavg-Tref HI/LO, Revision 000-02
OP2380, RPS and NI Safety Channel Operation, Revision 009-03
OP2203, Plant Startup, Revision 019-04
OP2204, Load Changes, Revision 023-10
OP2320, Feedwater Heater Drains and Vents, Revision 018-03
SP2651N, Main Control Valve Operability Test, Revision 004-05

Issue Reports (* indicates NRC-identified Issue Report)

| | | | | | |
|---|---|---|---|---|---|
| CR437224 | CR488587* | CR413602 | CR487493 | CR487797 | CR-07-12538 |
| CR474770 | CR475078 | CR456365 | CR476298 | | |

Miscellaneous

RCE 001044, Root Cause Evaluation: Unplanned 8% Reactor Power Excursion, Millstone Power Station Unit 2 (CR413602)
RCE 001057, Root Cause Evaluation: Unit 2 Trip Due to Low Suction Pressure Trip of B-SGFP, Millstone Power Station Unit 2 (CR431754)
RCE 001073, Root Cause Evaluation: MP3 Allowable Temperature Low Out of Band on Reactor Startup, Millstone Power Station Unit 3 (CR453799)
NRC Inspection Report: Millstone Power Station Unit 2 – NRC Special Inspection Report 05000336/2011008; Preliminary White Finding (ML11470484)
NRC Letter EA-11-047, "FINAL SIGNIFICANCE DETERMINATION FOR A WHITE FINDING, WITH ASSESSMENT FOLLOW-UP; NOTICE OF VIOLATION; AND RESULTS OF REGULATORY CONFERENCE [NRC SPECIAL INSPECTION REPORT NO. 055000336/2011010] – MILLSTONE POWER STATION UNIT 2" (ML112200394), dated August 8, 2011
ERF000343, Root Cause Effectiveness Review for RCE001044, Unplanned 8% Reactor Power Excursion, Millstone Power Station Unit 2
SAR001631, Formal Self Assessment, 95001 Readiness Review: RCE0001044 Unplanned 8% Reactor Power Excursion at Millstone Unit 2, dated December 15, 2011
Nuclear Oversight Assessment No. 12-42-M, Millstone NRC 95001 Inspection Readiness, dated June 13.2012
List of outstanding procedure revisions, dated September 12, 2012
Millstone Unit 2 Technical Specification Table 2.2-1, Reactor Protection Instrumentation Trip Setpoint Limits, Amendment 282
Millstone Unit 2 Technical Specification Table 3.3-1, Reactor Protective Instrumentation, Amendment 301
MPS-2 FSAR section 14.1.3, Increase in Steam Flow, Revision 26.2
SAR00136, Formal Self Assessment, 2012 Reactivity Management Dominion Fleet Self Assessment, dated February 26, 2012
Regulatory Guide 1.149, Nuclear Power Plant Simulation Facilities for Use in Operator Training, License Examinations, and Applicant Experience Requirements, Revision 4
Regulatory Guide 1.33, Quality Assurant Program Requirements (Operation), Revision 2
C11401C, Ops Manager Standards Cycle 11-4, Revision 0 Ch-1
S11401, LOAF with Condensate Feed Success Path, Revision 0
S11401L, Cycle 11-04 Sim #1, Revision 1
S12105L, Cycle 12-1, Simulator Session #5, Revision 0
S12103, LORT Cycle 12-1, Revision 0

Training Presentation, SOER 10-2 Case Study 1st Quarter 2012, "Unplanned 8% Reactor Power Excursion" Millstone Power Station Unit 2, February 12, 11
Training Review Board Meeting Agenda and Minutes, dated August 25, 2011
Millstone Station Pre Job Brief, Task 1054, Main Control Valve Operability Test, dated October 11, 2011
Leadership Forum 2012-3 presentation, "Analyzing Station Performance and Emergent Issue Response"
Dominion Formal Self-Assessment Report, INPO IER 11-03 Fleet Wide Operator Fundamentals Self Assessment, dated September 12, 2011
2012 Millstone Power Station Operations Department Human Performance Clock Resets, dated September 12, 2012
2012 Millstone Configuration Control Clock Resets, dated September 12, 2012
Listing of Human Error Condition Reports February 2011 – September 2012
Listing of Condition Reports with Operation Hot Buttons, February 2011 – September 2012
Operations Performance Summary, July 2012
Millstone Power Station, Operations Department – All Indicators, July 2012
Observation Form, Operator Field Rounds, dated September 12, 2012
Observation Form, Reactivity Management & Manipulations, dated September 12, 2012
Observation Form, THINK – High Standards for Controlling Plant Evolutions, dated September 12, 2012
Observation Form, THINK- Indications and Plant Conditions Monitored Closely, dated September 12, 2012
Observation Form, THINK- Natural Bias for conservative Approach to Plant Operations, dated September 12, 2012
Observation Form, THINK- Knowledge of Plant Design and Theory, dated September 12, 2012
Observation Form, THINK- Teamwork Effectiveness, dated September 12, 2012
Observation Form, Critical Parameter Monitoring, dated September 12, 2012
Observation Form, SOER 10-2, dated September 12, 2012
Work Observation System (WOBS) User Guide, Application Release 1.0, May 2012
Self-Evaluation/DSEM Performance Improvement Meeting Summary, Millstone Operations Department, dated July 18, 2012
Work Observation System listing of Observations for August, 2012
Crew Performance Review Meeting for "B" Crew Summary Slides, September 12, 2012
Crew Performance Review Meeting for "C" Crew Summary Slides, May 18, 2012
Crew Performance Review Meeting for "C" Crew Summary Slides, April 13, 2012
Post-Training Memo, Ops "A" Cycle 12-03, May 1-4, 2012

**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
**REGION I**
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

November 16, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Resources
5000 Dominion Blvd.
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION, UNITS 2 AND 3 – NRC EVALUATED EMERGENCY PREPAREDNESS EXERCISE – INSPECTION REPORT NOS. 05000336/2012503 AND 05000423/2012503

Dear Mr. Heacock:

On October 4, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Millstone Power Station, Units 2 and 3. The enclosed inspection report documents the inspection results, which were discussed in a debrief meeting on August 24, 2012, with Stephen E. Scace, Site Vice President, and other members of your staff. A final exit meeting was conducted via a telephone conference on October 4, 2012, also with Mr. Scace and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

The enclosed inspection report documents one NRC-identified finding of very low safety significance (Green). This finding was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because it has been entered into the corrective action program (CAP), the NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the Enforcement Policy. If you contest the finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Millstone. Additionally, if you disagree with the cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the Millstone NRC Resident Inspector.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room and from the Publicly Available Records (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

Anthony Dimitriadis, Chief
Plant Support Branch 1
Division of Reactor Safety

Docket Nos. 50-336, 50-423
License Nos. DPR-65, NPF-49

Enclosure:
NRC Inspection Report Nos. 05000336/2012503 and 05000423/2012503
w/Attachment: Supplemental Information

cc w/encl:
S. Coleman, RAC, FEMA Region I

cc w/encl: Distribution via ListServ

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room and from the Publicly Available Records (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

***/RA/***

Anthony Dimitriadis, Chief
Plant Support Branch 1
Division of Reactor Safety

Docket Nos. 50-336, 50-423
License Nos. DPR-65, NPF-49

Enclosure:
NRC Inspection Report Nos. 05000336/2012503 and 05000423/2012503
w/Attachment: Supplemental Information

cc w/encl:
S. Coleman, RAC, FEMA Region I

cc w/encl: Distribution via ListServ

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S. Barr, DRS
A. Dimitriadis, DRS

**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION I**

| | |
|---|---|
| Docket No.: | 50-336, 50-423 |
| License No.: | DPR-65, NPF-49 |
| Report No.: | 05000336/2012503 and 05000423/2012503 |
| Licensee: | Dominion Nuclear Connecticut, Inc. |
| Facility: | Millstone Nuclear Power Station, Units 2 and 3 |
| Location: | Waterford, CT 06385 |
| Dates: | August 20, 2012 – October 4, 2012 |
| Inspectors: | S. Barr, Senior Emergency Preparedness Inspector, DRS, Region I (Lead)<br>J. Ambrosini, Senior Resident Inspector, DRP, Region I<br>B. Haagensen, Resident Inspector, DRP, Region I<br>S. LaVie, Senior Emergency Preparedness Specialist, NSIR<br>W. Lange, Emergency Preparedness Specialist, NSIR (Observer) |
| Approved by: | Anthony Dimitriadis, Chief<br>Plant Support Branch 1<br>Division of Reactor Safety |

Enclosure

## SUMMARY OF FINDINGS

IR 05000336/2012503, 05000423/2012503; 8/20/2012-10/4/2012; Millstone Power Station, Units 2 and 3; Emergency Preparedness Exercise Evaluation.

This was an announced inspection conducted by one region-based inspector, two resident inspectors, and one headquarters-based inspector. One finding of very low safety significance (Green) was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). The cross-cutting aspect was determined using IMC 0310, "Components Within the Cross Cutting Areas." Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

**Cornerstone: Emergency Preparedness**

- **Green.** The NRC identified a non-cited violation (NCV) associated with emergency preparedness planning standard 10 CFR 50.47(b)(4), and the requirements of Sections IV.B and IV.C of Appendix E to 10 CFR Part 50. Specifically, Dominion did not maintain in effect the Millstone Units 2 and 3 emergency action level (EAL) schemes by not providing operations procedures for obtaining reactor coolant samples once a safety injection signal has occurred. These deficiencies adversely affected the ability of the licensee to properly classify events involving the loss of the fuel clad fission product barrier.

  The inspection team determined that the failure by Dominion to provide the proper operating procedures for operators to adequately implement their respective unit's EALs was a performance deficiency that was reasonably within their ability to foresee and prevent. The finding is more than minor because it is associated with the emergency response organization (ERO) attribute of the Emergency Preparedness Cornerstone and affected the cornerstone objective to ensure that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. The inspectors evaluated this finding using the Emergency Preparedness Significance Determination Process (Appendix B to IMC 0609) and determined the finding to be of very low safety significance (Green). Appendix B to IMC 0609, Section 5.4, and Table 5.4-1, were used to reach this determination. The inspector determined that this finding involved an example where an EAL has been rendered ineffective such that any Site Area Emergency would not be declared for a particular off-normal event, but because of other EALs, an appropriate declaration could be made in a degraded manner (e.g., delayed). The finding is related to the cross-cutting area of Problem Identification and Resolution, Corrective Action Program, in that Dominion personnel did not take appropriate corrective actions to address a Risk-Significant Planning Standard (RSPS) issue completely, accurately, and in a timely manner commensurate with the safety significance [P.1(d)]. Specifically, Dominion did not place this issue into the corrective action program and take appropriate action until prompted by the NRC team's findings.
  (Section 1EP1)

REPORT DETAILS

## 1. REACTOR SAFETY

Cornerstone: Emergency Preparedness (EP)

1EP1 Exercise Evaluation (71114.01 – 1 sample)

a. Inspection Scope

Prior to the August 21, 2012, emergency preparedness exercise, the NRC inspectors conducted an in-office review of the exercise objectives and scenario, which Dominion had submitted to the NRC, to determine if the exercise would test major elements of the Millstone Power Station Emergency Plan as required by 10 CFR 50.47(b)(14). This overall exercise inspection activity represented the completion of one sample on a biennial cycle.

The exercise evaluation consisted of the following review and assessment:

- The adequacy of Dominion's performance in the biennial full-participation exercise regarding the implementation of the risk-significant planning standards (RSPS) described in 10 CFR 50.47(b)(4), (5), (9), and (10), which are: emergency classification; offsite notification; radiological assessment; and protective action recommendations, respectively.

- The overall adequacy of Dominion's Millstone emergency response facilities with regard to NUREG-0696, "Functional Criteria for Emergency Response Facilities," and Emergency Plan commitments. The facilities assessed were the Control Room Simulator, Operations Support Center (OSC), Technical Support Center (TSC), and Emergency Operations Facility (EOF).

- A review of other performance areas, such as: the Millstone emergency response organization's (ERO's) recognition of abnormal plant conditions; command and control; intra- and inter-facility communications; prioritization of mitigating activities; utilization of repair and field monitoring teams; interface with offsite agencies; staffing and procedure adequacy; and the overall implementation of the emergency plan and its implementing procedures.

- A review of past performance issues from the last NRC Millstone exercise inspection report and Dominion's Millstone EP drill reports, to determine the effectiveness of licensee corrective actions as demonstrated during the August 21, 2012, exercise and to ensure compliance with 10 CFR 50.47(b)(14).

- The licensee's post-exercise critiques, to evaluate Dominion's self-assessment of its ERO performance during the August 21, 2012, exercise and to ensure compliance with 10 CFR 50, Appendix E, Section IV.F.2.g.

The inspectors reviewed the documents listed in the attachment to this report.

b. Findings

Introduction. The NRC identified an NCV associated with emergency preparedness planning standard 10 CFR 50.47(b)(4), and the requirements of Sections IV.B and IV.C of Appendix E to 10 CFR Part 50. Specifically, Dominion did not maintain in effect the Millstone Units 2 and 3 emergency action level (EAL) schemes for assessing the loss of the fuel clad barrier.

Description. On August 21, 2012, the NRC inspection team observed the Dominion Millstone Unit 3 full scale emergency planning exercise. The exercise scenario included the failure of a reactor coolant pump, which discharged a loose part into the reactor coolant system (RCS). The loose part, in turn, damaged the reactor fuel and a steam generator tube. Per the scenario, the damage to the fuel was intended for the ERO to diagnose a loss of the fuel clad barrier, and the damage to the steam generator tube a loss of the RCS. The basis for the ERO's conclusion that the fuel clad barrier was lost was a dose rate at one foot from an unpressurized RCS sample. The obtaining of the RCS sample during the exercise was simulated, and the sample results were provided to the ERO by a licensee drill controller.

The NRC inspector in the control room simulator identified a discrepancy with the exercise scenario and the actions of the drill controller. During the scenario, an expected safety injection signal had occurred, and one of the automatic actions of this signal is the isolation of the non-safety header of the reactor plant closed cooling water (RPCCW) system. The non-safety header of RPCCW provides the cooling water to the RCS sample sink, which is required to obtain an RCS sample. The inspector identified that without the RCS sample, the ERO would not have been able to diagnose the loss of the fuel clad barrier as provided in the scenario.

Further investigation by the inspector determined that the Unit 3 emergency operating procedures (EOPs) do not provide direction in a timely manner to un-isolate the RPCCW to the RCS sample cooler or the post accident sampling system. The inspector also determined that a similar situation existed with the Millstone Unit 2 EALs, in that Unit 2's reactor building component cooling water isolates in a similar manner and would prevent the timely gathering and assessment of a RCS sample for EAL purposes. The licensee had earlier opportunities to identify this discrepancy with both units. In 2004, the licensee initiated CR-04-08128, which identified that the Unit 2 RBCCW would isolate on a safety injection signal. In 2008, Dominion staff initiated CR-08-06929, which identified that RPCCW isolates on a safety injection signal and sampling would not be possible. Dominion responded to the inspector's concerns by stating that, for Unit 3, EOP 35 E-3, Steam Generator Tube Rupture, Step 33, has steps to un-isolate RPCCW for sampling purposes. For Unit 2, chemistry procedure CP 2802N, Primary Systems Sampling and Analysis, provides guidance for a chemistry technician to contact the control room if sampling is required when RBCCW has isolated. The inspector determined that while these procedures may provide guidance on how to correct the EAL deficiency, neither procedure would be readily referred to by operators involved in mitigating an emergency

event. The inspector did determine, however, that other thresholds in the Fuel Clad Barrier EAL would eventually allow the operators to determine that barrier had failed.

The NRC identified during this inspection that Dominion had failed to properly recognize and correct the deficiencies in both units' operating procedures that rendered the "dose rate at one foot from an unpressurized RCS sample" EAL impracticable for a scenario such as that presented in the Unit 3 EP exercise scenario. This type of scenario, in which one initiating event could reasonably cause the loss of two fission product barriers, could result in the declaration of a Site Area Emergency (SAE).

In response to the issues identified by the inspector, Dominion entered this issue into their corrective action plan and initiated CR-12-485651 to address the deficiencies identified by the inspector.

Analysis. The inspection team determined that the failure by Dominion to provide the proper operating procedures for operators to adequately implement their respective unit's EALs was a performance deficiency that was reasonably within their ability to foresee and prevent. The finding is more than minor because it is associated with the Emergency Response Organization (ERO) attribute of the Emergency Preparedness cornerstone and affected the cornerstone objective to ensure that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency.

The inspectors evaluated this finding using the Emergency Preparedness Significance Determination Process (Appendix B to IMC 0609) and determined the finding to be of very low safety significance (Green). Appendix B to IMC 0609, Section 5.4, and Table 5.4-1, were used to reach this determination. The inspector determined that this finding involved an example where an EAL has been rendered ineffective such that any SAE would not be declared for a particular off-normal event, but because of other EALs, an appropriate declaration could be made in a degraded manner (e.g., delayed), a Green finding per Table 5.4-1.

The finding is related to the cross-cutting area of Problem Identification and Resolution, Corrective Action Program, in that Dominion personnel did not take appropriate corrective actions to address the RSPS issue completely, accurately, and in a timely manner commensurate with the safety significance [P.1(d)]. Specifically, Dominion did not place this issue into the corrective action program and take appropriate action until prompted by the NRC team's findings.

Enforcement. Title 10 of the Code of Federal Regulations (CFR), Section 50.54(q)(2) requires, in part, that a licensee shall follow and maintain the effectiveness of an emergency plan that meets the requirements in Appendix E to this Part and, for nuclear power reactor licensees, the planning standards of § 50.47(b).

10 CFR 50.47(b)(4) requires, in part, that a standard emergency classification and action level scheme is in use by the licensee, the bases of which include facility system and effluent parameters.

Contrary to the above, Dominion did not follow and maintain an emergency plan using a standard emergency classification and action level scheme. Specifically, Dominion did not provide adequate operating procedures to adequately implement the Fuel Cladding Barrier of the Unit 2 and Unit 3 EAL tables. As a result, this deficiency adversely affected licensee's ability to classify an emergency event involving failures of fission product barriers. Because this issue was of very low safety significance (Green) and has been entered into the CAP (CR-12-485651), this issue is being treated as an NCV, consistent with the NRC's Enforcement policy. (**NCV 05000336/2012503-001 and 05000423/2012503-001, Failure to Adequately Implement Fuel Clad Barrier EALs**)

## 4. OTHER ACTIVITIES (OA)

### 4OA1 Performance Indicator (PI) Verification (71151 – 3 samples)

a. Inspection Scope

The inspectors reviewed data for the Millstone EP PIs, which are: (1) Drill and Exercise Performance (DEP); (2) Emergency Response Organization (ERO) Drill Participation; and, (3) Alert and Notification System (ANS) Reliability. The last NRC EP inspection at Millstone was conducted in August 2011, so the inspectors reviewed supporting documentation from EP drills, training records, and equipment tests from the third calendar quarter of 2011 through the second quarter of 2012, to verify the accuracy of the reported PI data. The review of these PIs was conducted in accordance with NRC Inspection Procedure 71151, using the acceptance criteria documented in NEI 99-02, "Regulatory Assessment Performance Indicator Guidelines," Revision 6. This inspection activity represented the completion of three samples.

b. Findings

No findings were identified.

### 4OA6 Meetings, including Exit

On August 24, 2012, the inspectors presented the preliminary results of this inspection to Mr. S. Scace, Millstone Site Vice President, and other members of the Dominion staff. On October 4, 2012, the inspectors conducted a phone teleconference exit meeting, also with Mr. Scace and other members of the Dominion staff. No proprietary information was provided to the inspectors during this inspection.

# ATTACHMENT

# SUPPLEMENTAL INFORMATION

## KEY POINTS OF CONTACT

**Licensee Personnel**

S. Scace, Site Vice President
D. Smith, Emergency Preparedness Manager

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

**Opened**

| | | |
|---|---|---|
| 05000336 and 05000423/2012503-001 | NCV | Failure to Adequately Implement Fuel Clad Barrier EALs |

## LIST OF DOCUMENTS REVIEWED

**Section 1EP1: Exercise Evaluation**
Millstone August 21, 2012, Emergency Exercise Data Package
Millstone Power Station Emergency Plan, Revision 44
Millstone Emergency Response Drill Reports, January 2011 – August 2012
Millstone Power Station Emergency Plan Implementing Procedures
Millstone Power Station Emergency Plan Administrative Procedures
EOP 35 E-3, Steam Generator Tube Rupture, Revision 23
CP 2802N, Primary Systems Sampling and Analysis, Revision 001-04
Condition Reports: CR-04-08128; CR-08-06929; CR-12-485651

**Section 4OA1: Performance Indicator Verification**
EP-AA-103, Emergency Preparedness Performance Indicators, Revision 2
ERO Drill Participation PI data, July 2011 – June 2012
Alert Notification System PI data, July 2011 – June 2012
DEP PI data, July 2011 – June 2012

## LIST OF ACRONYMS

| | |
|---|---|
| ADAMS | Agencywide Documents Access and Management System |
| ANS | Alert and Notification System |
| CFR | Code of Federal Regulations |
| CR | Condition Report |
| DEP | Drill and Exercise Performance |
| DRP | Division of Reactor Projects |
| DRS | Division of Reactor Safety |
| EAL | Emergency Action Level |
| EOF | Emergency Operations Facility |
| EOP | Emergency Operating Procedures |
| EP | Emergency Preparedness |
| ERO | Emergency Response Organization |
| IMC | Inspection Manual Chapter |
| NCV | Non-Cited Violation |
| NEI | Nuclear Energy Institute |
| NRC | Nuclear Regulatory Commission |
| OSC | Operations Support Center |
| PARS | Publicly Available Records |
| PI | Performance Indicator |
| RCS | Reactor Coolant System |
| RPCCW | Reactor Plant Closed Cooling Water |
| RSPS | Risk Significant Planning Standard |
| SAE | Sight Area Emergency |
| SDP | Significance Determination Process |
| TSC | Technical Support Center |

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

November 29, 2012

The Operating Power Reactors and Holders
of Construction Permits on Enclosed List

SUBJECT: STATUS OF 60-DAY RESPONSE TO ORDERS MODIFYING LICENSES REGARDING RECOMMENDATIONS 4.2, 5.1, AND 7.1 OF THE NEAR-TERM TASK FORCE RELATED TO THE FUKUSHIMA DAI-ICHI NUCLEAR POWER PLANT ACCIDENT

By letter dated March 12, 2012,[1] the U.S. Nuclear Regulatory Commission (NRC) issued three orders to modify commercial nuclear power reactor licenses in response to lessons learned from Japan's March 11, 2011, earthquake and subsequent tsunami. Order EA-12-049, "Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," is in response to Near-Term Task Force (NTTF) Recommendation 4.2; Order EA-12-050, "Reliable Hardened Containment Vents," is in response to NTTF Recommendation 5.1; and Order EA-12-051, "Reliable Spent Fuel Pool Instrumentation," is in response to NTTF Recommendation 7.1.

The orders required licensees to provide an initial status report describing the progress made in implementing the requirements for each of the three orders, 60 days following the issuance of each of the final interim staff guidance (ISG) documents for each of the orders. The ISGs were issued by the NRC staff on August 30, 2012.

This letter serves as an acknowledgement of receipt of the required status reports. The NRC staff acknowledges that the licensees provided the information required for each status report and has no additional questions at this time.

[1]EA-12-049, Agencywide Documents Access and Management System (ADAMS) Accession No. ML12054A735; EA-12-050, ADAMS Accession No. ML12054A694; EA-12-051, ADAMS Accession No. ML12073A202.

Should you have any questions regarding this letter, please contact Ms. Jessica Kratchman at 301-415-5112, regarding Recommendation 4.2; Mr. David Jaffe at 301-415-1439, regarding Recommendation 5.1; and Mr. Blake Purnell at 301-415-1380, regarding Recommendation 7.1.

Sincerely,

Michele G. Evans

Michele G. Evans, Director
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

cc: Listserv

Should you have any questions regarding this letter, please contact Ms. Jessica Kratchman at 301-415-5112, regarding Recommendation 4.2; Mr. David Jaffe at 301-415-1439, regarding Recommendation 5.1; and Mr. Blake Purnell at 301-415-1380, regarding Recommendation 7.1.

Sincerely,

*/ra/*

Michele G. Evans, Director
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

cc: Listserv

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| **DATE** | 11/23/2012 | 11/24/2012 | 11/24/2012 |
| **OFFICE** | BC: NRR/DORL/LPLI-2 | D: NRR/DORL | |
| **NAME** | MKhanna | MEvans | |
| **DATE** | 11/27/2012 | 11/29/2012 | |

**OFFICIAL RECORD COPY**

Letter from Michele Evans to All Operating Power Reactor Plants dated November 29, 2012

SUBJECT: STATUS OF 60-DAY RESPONSE TO ORDERS MODIFYING LICENSES REGARDING RECOMMENDATIONS 4.2, 5.1, AND 7.1 OF THE NEAR-TERM TASK FORCE RELATED TO THE FUKUSHIMA DAI-ICHI NUCLEAR POWER PLANT ACCIDENT

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Entergy Operations, Inc.
Docket Nos. 50-313 and 50-368
License Nos. DPR-51 and NPF-6

Mr. Christopher J. Schwarz
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Entergy Operations, Inc.
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1448 S.R. 333
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Beaver Valley Power Station
First Energy Nuclear Operating Co.
Docket Nos. 50-334 and 50-412
License Nos. DPR-66 and NPF-73

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Bellefonte Nuclear Power Station
Tennessee Valley Authority
Docket Nos. 50-438 and 50-439
Construction Permit Nos. CPPR-122 and CPPR-123

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Braidwood Station
Exelon Generation Co., LLC
Docket Nos. STN 50-456 and STN 50-457
License Nos. NPF-72 and NPF-77

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Browns Ferry Nuclear Plant
Tennessee Valley Authority
Docket Nos. 50-259, 50-260 and 50-296
License Nos. DPR-33, DPR-52 and DPR-68

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Brunswick Steam Electric Plant
Carolina Power & Light Co.
Docket Nos. 50-325 and 50-324
License Nos. DPR-71 and DPR-62

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Exelon Generation Co., LLC
Docket Nos. STN 50-454 and STN 50-455
License Nos. NPF-37 and NPF-66

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Callaway Plant
Union Electric Company
Docket No. 50-483
License No. NPF-30

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Calvert Cliffs Nuclear Power Plant
Calvert Cliffs Nuclear Power Plant, LLC
Docket Nos. 50-317 and 50-318
License Nos. DPR-53 and DPR-69

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Catawba Nuclear Station
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Docket Nos. 50-413 and 50-414
License Nos. NPF-35 and NPF-52

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Clinton Power Station
Exelon Generation Co., LLC
Docket No. 50-461
License No. NPF-62

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Columbia Generating Station
Energy Northwest
Docket No. 50-397
License No. NPF-21

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Comanche Peak Nuclear Power Plant
Luminant Generation Co., LLC
Docket Nos. 50-445 and 50-446
License Nos. NPF-87 and NPF-89

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Cooper Nuclear Station
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Docket No. 50-298
License No. DPR-46

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Crystal River Nuclear Generating Plant
Florida Power Corp.
Docket No. 50-302
License No. DPR-72

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Davis-Besse Nuclear Power Station
First Energy Nuclear Operating Co.
Docket No. 50-346
License No. NPF-3

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Diablo Canyon Power Plant
Pacific Gas & Electric Co.
Docket Nos. 50-275 and 50-323
License Nos. DPR-80 and DPR-82

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Donald C. Cook Nuclear Plant
Indiana Michigan Power Company
Docket Nos. 50-315 and 50-316
License Nos. DPR-58 and DPR-74

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Dresden Nuclear Power Station
Exelon Generation Co., LLC
Docket Nos. 50-237 and 50-249
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Duane Arnold Energy Center
NextEra Energy Duane Arnold, LLC
Docket No. 50-331
License No. DPR-49

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Edwin I. Hatch Nuclear Plant
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Docket Nos. 50-321 and 50-366
License Nos. DPR-57 and NPF-5

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Detroit Edison Co.
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H. B. Robinson Steam Electric Plant
Carolina Power & Light Co.
Docket No. 50-261
License No. DPR-23

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Indian Point Energy Center
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Docket Nos. 50-247 and 50-286
License Nos. DPR-26 and DPR-64

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License Nos. NPF-2 and NPF-8

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LaSalle County Station
Exelon Generation Co., LLC
Docket Nos. 50-373 and 50-374
License Nos. NPF-11 and NPF-18

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Limerick Generating Station
Exelon Generation Co., LLC
Docket Nos. 50-352 and 50-353
License Nos. NPF-39 and NPF-85

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License Nos. DPR-65 and NPF-49

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Monticello Nuclear Generating Plant
Northern States Power Company
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License No. DPR-22

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Nine Mile Point Nuclear Station
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Docket Nos. 50-220 and 50-410
License Nos. DPR-63 and NPF-69

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North Anna Power Station
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Docket Nos. 50-338 and 50-339
License Nos. NPF-4 and NPF-7

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Oconee Nuclear Station
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Docket Nos. 50-269, 50-270 and 50-287
License Nos. DPR-38, DPR-47 and DPR-55

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Oyster Creek Nuclear Generating Station
Exelon Generation Co., LLC
Docket No. 50-219
License No. DPR-16

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Palisades Nuclear Plant
Entergy Nuclear Operations, Inc.
Docket No. 50-255
License No. DPR-20

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27780 Blue Star Memorial Highway
Covert, MI 49043

Palo Verde Nuclear Generating Station
Arizona Public Service Company
Docket Nos. STN 50-528, STN 50-529 and STN 50-530
License Nos. NPF-41, NPF-51 and NPF-74

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Peach Bottom Atomic Power Station
Exelon Generation Co., LLC
Docket Nos. 50-277 and 50-278
License Nos. DPR-44 and DPR-56

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Perry Nuclear Power Plant
FirstEnergy Nuclear Operating Co.
Docket No. 50-440
License No. NPF-58

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FirstEnergy Nuclear Operating Company
Perry Nuclear Power Plant
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Perry, OH 44081

Pilgrim Nuclear Power Station Unit No. 1
Entergy Nuclear Operations, Inc.
Docket No. 50-293
License No. DPR-35

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Pilgrim Nuclear Power Station
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Point Beach Nuclear Plant
NextEra Energy Point Beach, LLC
Docket Nos. 50-266 and 50-301
License Nos. DPR-24 and DPR-27

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NextEra Energy Point Beach, LLC
Point Beach Nuclear Plant, Units 1 & 2
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Two Rivers, WI 54241-9516

Prairie Island Nuclear Generating Plant
Northern States Power Co. Minnesota
Docket Nos. 50-282 and 50-306
License Nos. DPR-42 and DPR-60

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Northern States Power Company - Minnesota
Prairie Island Nuclear Generating Plant
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Quad Cities Nuclear Power Station
Exelon Generation Co., LLC
Docket Nos. 50-254 and 50-265
License Nos. DPR-29 and DPR-30

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R. E. Ginna Nuclear Power Plant
R.E. Ginna Nuclear Power Plant, LLC
Docket No. 50-244
License No. DPR-18

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R.E. Ginna Nuclear Power Plant
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River Bend Station
Entergy Operations, Inc.
Docket No. 50-458
License No. NPF-47

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Entergy Operations, Inc.
River Bend Station
5485 U.S. Highway 61N
St. Francisville, LA 70775

San Onofre Nuclear Generating Station
Southern California Edison Company
Docket Nos. 50-361 and 50-362
License Nos. NFP-10 and NFP-15

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Seabrook Nuclear Plant
NextEra Energy Seabrook, LLC
Docket No 50-443
License No. NFP-86

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Sequoyah Nuclear Plant
Tennessee Valley Authority
Docket Nos. 50-327 and 50-328
License Nos. DPR-77 and DPR-79

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Shearon Harris Nuclear Power Plant
Carolina Power & Light Co.
Docket No. 50-400
License No. NPF-63

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Progress Energy Carolinas, Inc.
Shearon Harris Nuclear Power Plant
P. O. Box 165, Mail Zone 1
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South Texas Project
STP Nuclear Operating Co.
Docket Nos. 50-498 and 50-499
License Nos. NPF-76 and NPF-80

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South Texas Project Electric Generating Station
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St. Lucie Plant
Florida Power & Light Co.
Docket Nos. 50-335 and 50-389
License Nos. DPR-67 and NPF-16

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Surry Power Station
Virginia Electric & Power Co.
Docket Nos. 50-280 and 50-281
License Nos. DPR-32 and DPR-37

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Susquehanna Steam Electric Station
PPL Susquehanna, LLC
Docket Nos. 50-387 and 50-388
License Nos. NPF-14 and NPF-22

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Three Mile Island, Unit 1
Exelon Nuclear
Docket No. 50-289
License No. DPR-50

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Turkey Point
Florida Power & Light Co.
Docket Nos. 50-250 and 50-251
License Nos. DPR-31 and DPR-41

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Vermont Yankee Nuclear Power Station
Entergy Nuclear Operations, Inc.
Docket No. 50-271
License No. DPR-28

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Virgil C. Summer Nuclear Station
South Carolina Electric & Gas Co.
Docket No. 50-395
License No. NPF-12

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Vogtle Electric Generating Plant
Southern Nuclear Operating Co.
Docket Nos. 50-424 and 50-425
License Nos. NPF-68 and NPF-81

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Waterford Steam Electric Station
Entergy Operations, Inc.
Docket No. 50-382
License No. NPF-38

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Watts Bar Nuclear Plant, Units 1 and 2
Watts Bar Nuclear Plant, Unit 1
Tennessee Valley Authority
Docket No. 50-390
License No. NPF-90

Watts Bar Nuclear Plant, Unit 2
Tennessee Valley Authority
Docket No. 50-391
Construction Permit No. CPPR No. 092

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William B. McGuire Nuclear Station
Duke Energy Carolinas, LLC
Docket Nos. 50-369 and 50-370
License Nos. NPF-9 and NPF-17

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Wolf Creek Generating Station
Wolf Creek Nuclear Operating Corp.
Docket No. 50-482
License No. NPF-42

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# Appendix 3

# NEAC Endorsement of The Future of Nuclear Power CASE Study Recommendations

**NEAC Endorsement of CASE Study Recommendations**

The Nuclear Energy Advisory Council (NEAC) endorses the following recommendations of the Connecticut Academy of Science and Engineering (CASE) study regarding the future of Nuclear Energy in Connecticut.

## *Advantages of Nuclear Power*

RECOMMENDATION

Nuclear power should be considered for baseload generation to balance the reliance on natural gas once the federal government has developed a permanent federal repository or a regional centralized interim storage facility for spent nuclear fuel. Benefits of developing a new nuclear power plant unit in Connecticut include the potential for higher in-state job creation during both construction and operation, and emission-free electricity generation. In contrast, the major expense of a CCGT power plant is the cost of natural gas which must be imported into the state.

## *Issues Facing the Expansion of Nuclear Power in Connecticut*

### 1. Disposal and Storage of Spent Nuclear Fuel

RECOMMENDATION

The study committee agrees with the recommendations made by the Blue Ribbon Commission that there is an urgent need to expeditiously develop one or more geological disposal and interim storage facilities. This issue must be resolved before nuclear power can be considered a viable alternative to natural gas as a baseload source of electricity in Connecticut. To achieve this, the State of Connecticut should join other affected states and aggressively demand that the federal government meets its legal obligation regarding management of spent fuel and high-level nuclear waste.

## Nuclear Safety and Security

RECOMMENDATION

Safety must never be taken for granted. It is imperative that the state and federal government continue to monitor and assess the safety record of the nuclear industry. On-site inspections, simulated terrorist attacks, and incorporation of the latest safety technologies are examples of the continuing diligence needed to increase the trust and confidence of the public in nuclear technology.

## Nuclear Fuel Reprocessing

**RECOMMENDATION**

The state should monitor federal activities with regard to development and implementation of a nuclear fuel cycle. Advances in this area have the potential to reduce the volume of high-level radioactive waste and increase the amount of energy that can be obtained from uranium reserves. As recommended previously, the study committee concurs with the Blue Ribbon Commission regarding the urgent need to site and license a permanent repository for spent nuclear fuel.

## Siting

RECOMMENDATION

Siting of a new nuclear facility in Connecticut should be located at the Millstone Power Station in Waterford or Connecticut Yankee in Haddam Neck. Millstone has the infrastructure already available, including cooling water intake structures, security force, dry cask spent fuel storage, significant switchyard equipment, etc., to support the operation of a new unit. It is expected that there would be local support because the communities surrounding these facilities are familiar with nuclear power. While the decommissioning process has been completed, the Connecticut Yankee site still has some transmission infrastructure in place for future use and was once approved for nuclear operations.

## Energy Education and Public Awareness

**RECOMMENDATION**

Energy education — in the K-12 state curriculum, as well as in seminars at state colleges and universities, and through public service announcements—is needed so that the public can be more informed about the state's energy future in regard to nuclear power, fossil fuels, renewable energy, and conservation.

The other recommendations of the CASE study may be supported by NEAC members as individuals but do not fall under the NEAC charter in State Statutes.

### *Connecticut and New England Electric Rates*

RECOMMENDATION

The current structure of the New England regional and Connecticut electricity markets is not conducive to adding new or replacement low-cost baseload electricity generation and having the full cost savings realized in lower electricity prices. Changes are needed in the "deregulated" market so that replacement of inefficient electricity generating facilities or the addition of new low-cost generation more fully translates into lower electricity prices that will make Connecticut more competitive in attracting businesses and creating jobs. Connecticut should develop a plan that allows lower costs of generation from baseload plants to be passed on to consumers.

### *Need for Additional or Replacement Baseload Generation and Impact on Electric Rates*

RECOMMENDATION

Connecticut should be proactive in developing in-state electricity generating facilities to meet the state's demand and consider potential benefits such as lower electricity prices through lower generation costs and electricity congestion charges, and potential job creation from becoming exporter of electricity.

### *Comparison of Baseload Alternatives: Nuclear Power and Natural Gas*

**RECOMMENDATION**

Fuel diversity should be promoted by the state as both a strategy to stabilize electricity prices and a regional policy. Since deregulation of the electricity market, essentially all new electricity generation has used natural gas as its primary fuel. Overreliance on natural gas may lead to price instability and potential gas pipeline transmission constraints, especially during cold weather periods when there is increased demand for natural gas for space heating.

### *Advances in Nuclear Power*

RECOMMENDATION

The first-build construction of four Generation III+ nuclear facilities in the United States should be monitored by the Connecticut Energy Advisory Board (CEAB), the Department of Energy and Environmental Protection and other state leaders to verify that advances in construction techniques have achieved the anticipated benefits of lower construction costs and shorter construction time frames, with the new plants being delivered on schedule and on budget.

## 1. Financing of a 1000 MW Nuclear Power Plant

RECOMMENDATION

Stable policies that reduce financial risk and provide confidence to allow for private investment are needed. Examples include:

- loan guarantees beyond the first-build reactors
- long-term contracts for the electricity generated
- economic incentive for fuel diversification
- economic incentives for emission-free electricity generation, e.g., product tax credits
- appropriate public / private business models that balance risk