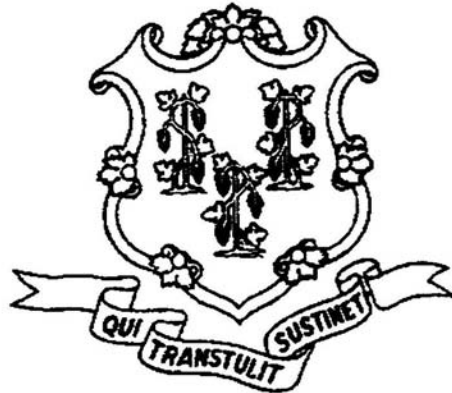


# STATE OF CONNECTICUT



## THE NUCLEAR ENERGY ADVISORY COUNCIL REPORT

# 2011

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

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

**December 8, 2011**

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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 sixteenth annual report presented by the Nuclear Energy Advisory Council (NEAC). During calendar year (CY) 2011, the NEAC met four times and received reports from representatives of the Nuclear Regulatory Commission (NRC), Dominion Nuclear Connecticut and Cort Richardson, Director of the New England High Level Radioactive Waste Transportation Project who discussed the Draft Report of the President's Blue Ribbon Committee on Nuclear Waste Disposal. Routine NRC Millstone Power Station inspection and performance assessment reports were also received and reviewed. During the fourth quarter of 2010, Millstone Units 2 and 3 plant performance (Action Matrix) was classified as "GREEN", meaning that all inspection findings for CY 2010 were classified as having no or low safety significance. In the first quarter of 2011 there were two licensee-identified violations of very low safety significance and both Millstone 2 and Millstone 3 remained in the GREEN classification. During the second quarter, there were two Severity Level IV non-cited violations and two licensee identified findings of very low safety significance. In the third quarter there was one licensee revealed finding of very low safety significance. Results for the fourth quarter 2011 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 2 and 3 in CY 2011. Included in those baseline inspections were a Radiation Safety Inspection of Millstone Unit 1, NRC Independent Spent Fuel Storage Installation Inspection, and NRC Security Inspection. There were no 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 modification of the inspection plan for Millstone 2. Special Inspections were also scheduled as a result of the Fukushima Daiichi Accident in the area of Severe Accident Management Guidelines.

Scheduled decommissioning activities of the industrial areas at Connecticut Yankee Atomic Power Company (CYAPC) 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 and greater than Class C 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 (ISFI).

## COUNCIL ACTIVITIES IN 2011

### MEETINGS:

As required by PA 96-245, the NEAC held four public meetings as follows: (1) May 25, 2011, (2) August 24, 2011 at Waterford Town Hall , Waterford, CT, (3) September 22, 2011 at the East Lyme Senior Center, East Lyme, CT; and (4) December 8, 2011 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:

May 25, 2011: 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 CY2010 and a discussion of U. S. Nuclear Plant safe operation in light of the events in Fukushima, Japan. It was reported that overall these two units were operated in a manner that preserved public health and safety and fully met NRC cornerstone objectives. Accordingly, the NRC planned to conduct only baseline inspections at the facility through September 30, 2011 but a reactive inspection was conducted due to a plant event in February 2011.

August 24, 2011: NEAC was briefed by Cort Richardson, Director, NE High Level Radioactive Waste Transportation Project on the Draft Report of the Blue Ribbon Committee on Nuclear Waste Disposal. The seven key recommendations of the report were explained.

September 22, 2011: This meeting was conducted at East Lyme Senior Center, East Lyme, Connecticut. Dominion Nuclear Connecticut representatives provided a station update. Recent Millstone Station inspection results correspondence received from the NRC was also discussed.

December 8, 2011: This meeting was held at the Waterford Town Hall, Waterford, Connecticut. The CY2011 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 CY2012 was approved and possible topics for the meetings were discussed.

Council member Robert John Klancko attended the numerous meetings of the Connecticut Academy of Science and Engineering's Advances in Nuclear Power Technology Study Sub-Committee as a representative of NEAC. He participated as a public observer and was able to have a dialog with the study committee members. NEAC member Dr. Ed Wilds was a member of the subcommittee in his role as Director of the Radiation Division of the Bureau of Air Management, Connecticut DEEP. CASE published this extensive study on October of 2011 and some members of NEAC were present at the official briefing that was held at the Legislative Office Building on December 9, 2011.

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 CY2011

## **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.

Routine inspections conducted between October 1, 2010 and September 30, 2011 resulted in the identification of two Site issues, four Unit 2 issues, and three Unit 3 issues, all of very low safety significance (GREEN). An additional NRC Inspection was completed on November 18, 2010 that examined activities relating to Changes, Tests, or Experiments and Permanent Modifications. No findings were identified in the December 22, 2010 report of the inspection. On December 31, 2010, the NRC completed its annual inspection of the Emergency Preparedness Program and the Annual Inspection of the Security Program. Both inspections started on January 1, 2010. Observations and findings were provided in separate correspondence. There were two special investigations to determine if two different contract employees 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 not to be deliberate and one employee's action was determined to be deliberate. Based on all circumstances, a non-cited violation (NCV) was appropriate in both cases. On July 1, 2011 the NRC also completed a security baseline inspection. No findings were identified during the inspection. On April 28, 2011 the NRC completed a special inspection of Millstone Power Station to promptly assess the capabilities of Millstone to respond to extraordinary consequences similar to those that occurred at the Japanese Fukushima Daiichi Nuclear Station. The intent of the inspection was to provide a broad overview of the nuclear industry's preparedness for events that may exceed the current design basis for a plant. The potential issues and observations identified by the inspection will be evaluated by the NRC to determine if any of the issues identified are regulatory findings or violations. The follow up report has not yet been released by the NRC. NRC had not released the results of the fourth quarter 2010 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 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.

A radiation safety Inspection of Millstone Unit 1 was conducted between July 11-13, 2011. No findings or violations were reported in the August 10, 2011 letter reporting the results of this inspection.

## **CONNECTICUT YANKEE**

The Connecticut Yankee nuclear power (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 CY 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.

The ISFSI site has had no lost time accidents. Staffing levels at the ISFSI are stable.

CYAPC conducted its Annual Local Law Enforcement Training and Annual Fire Department Training on April 21, 2011.

The third quarter groundwater sampling was completed during the month of September, 2011. Preliminary results show all wells below the Remediation Standard Regulations (RSRs) for both chemical and radiological constituents.

The DEEP issued a Stewardship Permit in October 2007 certifying that site remediation for soil was complete with all areas meeting the Connecticut Remediation Standard Regulations. The permit will continue in place until the long-term groundwater monitoring program is completed and all monitoring well samples meet the EPA and Connecticut Remediation Standard Regulations criteria for groundwater.

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 17, 2011. The committee plans to meet again in the spring of 2012.

## **HIGH LEVEL NUCLEAR WASTE**

- NEAC continued to monitor activity to establish a permanent solution for spent nuclear fuel rods 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 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 is due to the Secretary of Energy in January 2012. 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.

### **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 High Level Waste and Greater Than Class C Low-Level Radioactive Waste and the safe transfer of this nuclear waste from Connecticut.



## 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.

**NUCLEAR ENERGY ADVISORY COUNCIL**  
**6:30 PM**  
**May 25, 2011**  
**WATERFORD TOWN HALL AUDITORIUM**  
**WATERFORD, CT**  
**SPECIAL MEETING**  
**MINUTES**

**Members Present**

Mr. Bill Sheehan, Chair  
Ms. Pearl Rathbun, Vice Chair  
Mr. Denny Hicks  
Mr. John Markowicz  
Dr. Gregg Dixon  
Ms. Marjorie DeBold  
Dr. Edward Wilds representing Commissioner Esty

Absent:

Rep. Kevin Ryan  
Mr. Robert Klancko  
Mr. James Sherrard  
Mr. Tom Nebel

**1. Call to Order of Meeting Co-Chaired by NEAC and NRC Region 1**

NEAC Chair Sheehan called the meeting to order at 6:31PM at Waterford Town Hall Auditorium in Waterford, Connecticut.

**2. NRC Reactor Oversight Program/Millstone End of Cycle Report**

- a. Discussion of Millstone Power Station Performance in 2010 – D. Jackson, Chief, Reactor Projects Branch 5, Region1.  
6:32 PM NRC provided presentation on Millstone Station Safety Performance for 2010 , 2010 Reactor Oversight Process. All of the following NRC Staff present participated in presentation with Don Jackson.
  - i. James Clifford, Deputy Director, Division of Reactor Projects, Region 1
  - ii. Steve W. Shaffer, Millstone Senior Resident Inspector
  - iii. James A. Krafty, Millstone Resident Inspector
  - iv. Brian Haagensen, Millstone Resident Inspector
  - v. John Hughey, Special Projects, NRC HQ
  - vi. Harold Chernoff, Licensing Branch Chief, NRC HQ
  
- b. Discussion of U.S. plant safe operations in light of Japan event – D. Jackson, Chief, Reactor Projects Branch 5, Region1.  
6:38 PM NRC provided presentation on U.S. Nuclear Plant Safety in light of Japan Events. All NRC Staff present participated in presentation with Don Jackson.

- c. NEAC Question Period.
  - i. NEAC ask several questions related to events in Japan related to worker doses, radiation caused deaths, explanation of explosions, etc. NRC indicated that they did not have verified information to address these questions and could not speculate.
  - ii. NEAC ask if the Unit 1 SFP pump was needed to circulate water to keep the SNF cool. NRC indicated that the fuel had not been irradiated in a long time and that now the pump circulates water for purification purposes, not cooling.
  - iii. NEAC asked about the status of the Safety Conscience Work Environment (SCWE), Employee Concerns Program (ECP) and Allegations at Millstone. NRC indicated that the SCWE is very good and a lot of concerns are put into the CR program. Millstone is within the normal range for all these programs.
  - iv. NEAC asked about the status of the Condition Report (CR) program. NRC indicated that the volume is about the same and that Millstone does not really have a CR backlog like in the past. n past few years.
  
- d. Public Question Period
  - i. Ms. Nancy Burton made several comments regarding an Inspection Report related to Millstone that she had that she stated was dated April 28<sup>th</sup> and other documents she had in her possession. She was concerned with statements made about Fukushima, especially the stability of Unit 4. She was also concerned that there was insufficient detail in the report and conflicting statements between the two documents. NRC indicated that they believed the reports appropriately addressed safety at Millstone.
  
- e. Meeting recessed at 7:55 PM

### **3. NEAC Business Meeting**

At 8:07 PM the Chair called the meeting to order to continue NEAC business.

- a. Correspondence received by Chairman Sheehan were reviewed. See attached. Chairman Sheehan asked if the Council had any questions or comments. None were given.
- b. Robert Klancko Handouts. Chairman Sheehan handed out the documents provide by Mr. Robert Klanko. See Attached. No comments by members present.
- c. Next meeting is July 21, 2011 at 7 PM. Chairman Sheehan requested Dr. Wilds to try to make arrangements for Mr. Cort Richardson to present the findings of the President's Blue Ribbon Commission findings. Tour of Millstone Power Station with Dominion is tentatively scheduled for September 2011.

### **4. Adjournment**

Motion was made and seconded to adjourn; no objections; unanimous vote in favor; meeting adjourned at 8:12 PM.



# **Millstone NEAC Meeting**

## **Millstone Power Station Safety Performance in 2010 & U.S. Nuclear Plant Safety in light of Japan Events**

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**2010 Reactor Oversight Process  
Nuclear Regulatory Commission – Region I**



# ***NRC Representatives***

- **Jim Clifford – Deputy Director, Division of Reactor Projects**
- **Don Jackson – Branch Chief**
- **Steve Shaffer – Senior Resident Inspector**
- **Brian Haagensen – Resident Inspector**
- **Jim Krafty – Resident Inspector**



# ***Agenda***

- **Introduction**
- **Discussion of Millstone safety performance**
- **Discussion of U.S. nuclear plant safety in light of Japan events**
- **NRC to address NEAC questions and questions from the public**
- **Closing remarks**



# ***NRC Assessment Summary***

- **Dominion operated Millstone safely and in a manner that preserved the public health and safety and protected the environment.**
- **Licensee response column of the Action Matrix**
- **Baseline inspections planned for 2011 based on 2010 assessment. However, a reactive inspection was conducted due to a plant event in February 2011**



# *Inspection Activities in 2010*

- 8258 hours of inspection and related activities
- 3 resident inspectors on site – residents perform inspections daily and can respond to plant events at any time
- 16 regional inspections
- 3 major team inspections
  - Problem Identification & Resolution
  - Triennial Fire Protection
  - Emergency Preparedness Exercise

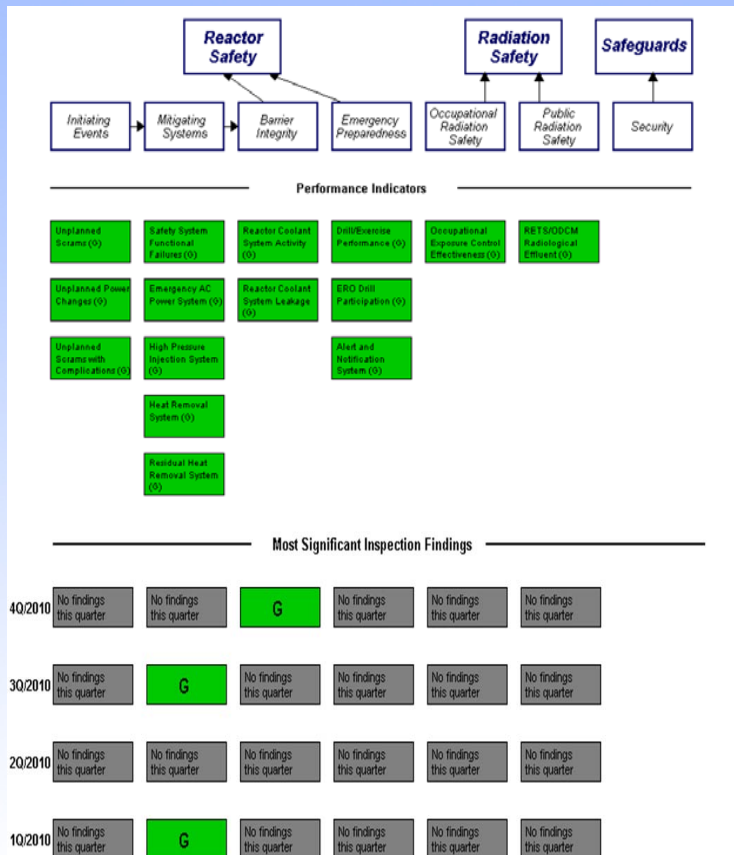






# Performance Indicator and Inspection Results

January 1 through December 31, 2010



- All Green Performance Indicators
- 13 Green/Severity Level IV inspection findings
- No greater than green/severity level IV inspection findings



# NRC Action Matrix

Licensee Response	Regulatory Response	Degraded Cornerstone	Multiple Repetitive Degraded Cornerstone	Unacceptable Performance
All Inputs are Green; Cornerstone Objectives Fully Met	1 or 2 White Inputs; Cornerstone Objectives Fully Met	2 White or 1 Yellow Input; Cornerstone Objectives Met w/ Moderate Degradation in Safety Performance	Multiple Yellow Inputs or 1 Red Input; Cornerstone Objectives Met w/ Significant Degradation in Safety Performance	Overall Unacceptable Performance; Plants not permitted to Operate w/in this Column; Unacceptable Margin to Safety



- **Increasing safety significance**
- **Increasing NRC inspection efforts**
- **Increasing NRC/Licensee management involvement**
- **Increasing regulatory actions**



# 2010 Millstone Assessment Summary

- Millstone Power Station was operated safely
- Licensee Response column of the Action Matrix
- Baseline inspections planned for 2011 based on 2010 assessment. However, a reactive inspection was conducted due to a plant event in February 2011





# ***Millstone Assessment Meeting***

## **U.S. Nuclear Plant Safety in Light of Japan Events**



# ***Fukushima: Facts We Know Today***

- **9.0 Earthquake**
  - **4th largest in the world since 1900**
- **Reactors safely shutdown**
- **Site then hit by a ~40 foot Tsunami**
- **Tsunami caused a loss of all electrical power**





# *Fukushima: Facts We Know Today*

- **Loss of all electrical power to safety systems eventually led to fuel damage**
- **Secondary containment hydrogen explosions visible at Units 1 & 3 several days later**
- **Radiological releases**





# ***Emergency Planning Zones and Protective Action Recommendations***

- **Limited and uncertain data was available**
- **Significant challenges to 3 units and at least 2 spent fuel pools on site**
- **Potential for large offsite release existed**
- **Elevated dose rates on site presented challenges to crews attempting to stabilize reactor**
- **Limited offsite data suggested serious damage to fuel**
- **Winds shifting from out to sea to land**



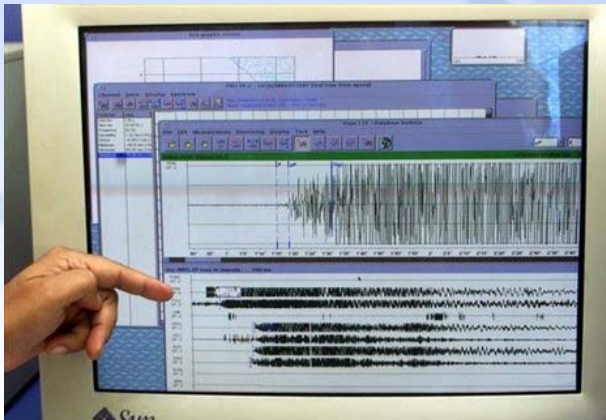
# ***U.S. Considerations***

- **No anticipated U.S. health effects from Fukushima**
- **Methodical and systematic review in progress**
- **U.S. nuclear plants remain safe**
  - NRC requires plants to be designed to withstand external events
  - NRC requires a defense-in-depth approach
  - NRC performs independent safety inspections
  - NRC assesses new safety information and requires improvements.





# *Designed for Site Specific Natural Events*



- Earthquakes
- Tsunamis
- Hurricanes
- Floods
- Tornadoes

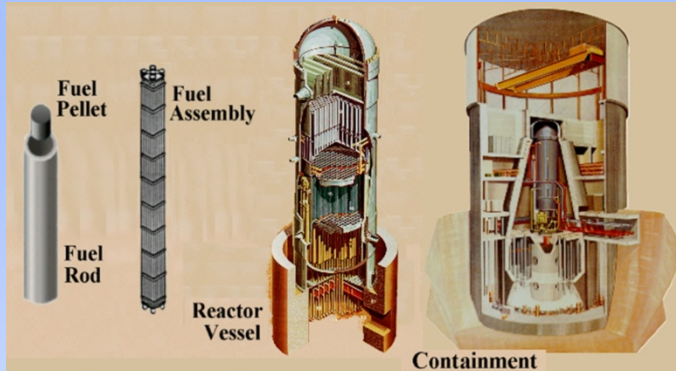


# **Millstone Seismic Considerations**

- **NRC seismic limits based on ground shaking**
- **Plants designed to a ground-shaking level appropriate for location**
- **Design incorporated largest expected earthquake in region**
- **Design includes seismic safety margins**
- **Southeastern New England-Maritime Tectonic Province taken into account**



# The NRC Requires Defense-In-Depth



- Redundant and diverse safety systems
- Multiple physical barriers to contain radioactive material
- Testing and inspection of systems important to safety
- Emergency planning





# ***NRC Independent Safety Inspections***

## **Reactor Oversight Program**

- **NRC inspectors have unfettered access to all plant activities related to nuclear safety and security**
- **At least two full-time NRC resident inspectors at each nuclear plant**
- **NRC specialists conduct additional inspections at each nuclear plant**

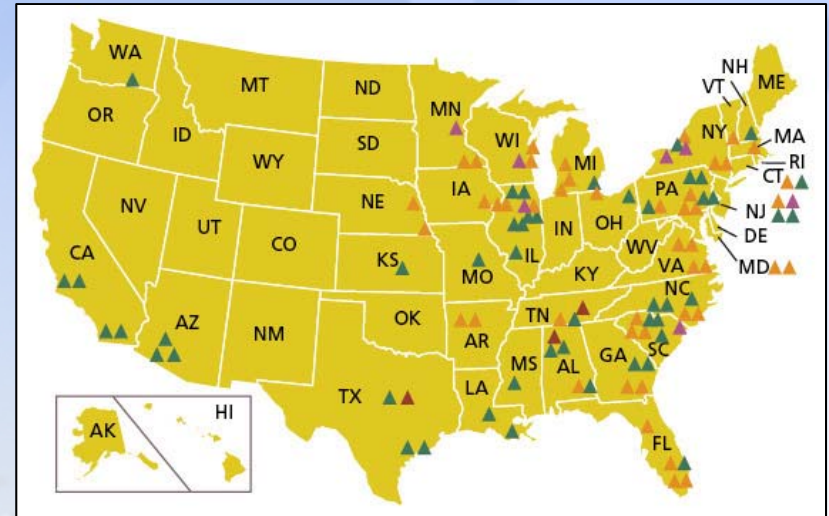




# ***NRC Requires Safety Improvements***

**NRC assesses new safety information, develops lessons learned, and requires safety enhancements:**

- **NRC operating experience program**
- **Rulemaking (Station Blackout)**
- **Post TMI Actions**
- **Post 9/11 Orders**
- **Generic Safety Issues**





# ***NRC Response to Events in Japan***

- **NRC conducting a methodical and systematic review**
- **Near-term actions (<90 days)**
  - **conducting additional inspections**
  - **identifying near term operational issues**
- **Longer-term actions**





# ***NRC Near-Term Review***

- **Evaluate Fukushima Daiichi Events**
- **Domestic operating reactors and spent fuel pools**
- **Staff briefed the Commission in a public meeting on May 12**
- **Next briefing scheduled for June 16**
- **Final recommendations in public meeting July 19**



# ***NRC Long-Term Review***

- **Sequence of events and the status of equipment during the event**
- **Evaluate all technical and policy issues**
- **Evaluate potential interagency issues**
- **Applicability of lessons learned to non-operating reactor and non-reactor facilities**
- **Report to the Commission within 6 months from the start of the evaluation**





# ***NRC Actions to Date***

- **Information Notice 2011-05, “Tohoku-Taiheiyou-Oki Earthquake Effects on Japanese Nuclear Power Plants”**
- **Temporary Instruction (TI) 183**
- **TI 184**
- **Bulletin 2011-01, “Mitigating Strategies”**
- **Task force established**



# ***Summary***

- **Safety of current facilities remains top priority**
- **The NRC will continue to perform a systematic and methodical review of the Fukushima event**
- **The NRC will take action based on results of the review to ensure the continued safety of U.S. commercial nuclear power plants**



# Questions





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

December 22, 2010

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

SUBJECT: MILLSTONE POWER STATION – NRC EVALUATION OF CHANGES, TESTS,  
OR EXPERIMENTS AND PERMANENT MODIFICATIONS TEAM INSPECTION  
REPORT 05000336/2010010 AND 05000423/2010010

Dear Mr. Heacock:

On November 18, 2010, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Millstone Power Station Unit 2 and Unit 3. The enclosed inspection report documents the inspection results, which were discussed on November 18, 2010, with Mr. A. J. Jordan, 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 reviewed selected procedures, calculations and records, observed activities, and interviewed station 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, 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 Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

A handwritten signature in black ink that reads "Lawrence T. Doerflein".

Lawrence T. Doerflein, Chief  
Engineering Branch 2  
Division of Reactor Safety

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

Enclosure: Inspection Report No. 05000336/2010010 and 05000423/2010010  
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

December 22, 2010

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

**SUBJECT: MILLSTONE POWER STATION – NRC EVALUATION OF CHANGES, TESTS,  
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Sincerely,

*/RA/*

Lawrence T. Doerflein, Chief  
Engineering Branch 2  
Division of Reactor Safety

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

Enclosure: Inspection Report No. 05000336/2010010 and 05000423/2010010  
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

SUNSI Review Complete: LTD (Reviewer's Initials)

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.: 50-336, 50-423

License Nos.: DPR-65, NPF-49

Report Nos.: 05000336/2010010; 05000423/2010010

Licensee: Dominion Nuclear Connecticut, Inc.

Facility: Millstone Power Station, Units 2 and 3

Location: P. O. Box 128  
Waterford, CT 06385

Inspection Period: November 1 through November 18, 2010

Inspectors: S. Pindale, Senior Reactor Inspector, Division of Reactor Safety (DRS),  
Team Leader  
M. Orr, Reactor Inspector, DRS  
J. Rady, Reactor Inspector, DRS

Approved By: Lawrence T. Doerflein, Chief  
Engineering Branch 2  
Division of Reactor Safety

## SUMMARY OF FINDINGS

IR 05000336/2010010, 05000423/2010010; 11/01/2010 – 11/18/2010; Millstone Power Station, Units 2 and 3; Engineering Specialist Plant Modifications Inspection.

This report covers a two week on-site inspection period of the evaluations of changes, tests, or experiments and permanent plant modifications. The inspection was conducted by three region based engineering inspectors. 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.

No findings were identified.



## REPORT DETAILS

### 1. REACTOR SAFETY

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

#### 1R17 Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications (IP 71111.17)

#### .1 Evaluations of Changes, Tests, or Experiments (34 samples)

##### a. Inspection Scope

The team reviewed nine safety evaluations to determine whether the changes to the facility or procedures, as described in the Updated Final Safety Analysis Report (UFSAR), had been reviewed and documented in accordance with 10 CFR 50.59 requirements. In addition, the team evaluated whether Dominion had been required to obtain NRC approval prior to implementing the changes. The team interviewed plant staff and reviewed supporting information including calculations, analyses, design change documentation, procedures, the UFSAR, the Technical Specifications (TS), and plant drawings to assess the adequacy of the safety evaluations. The team compared the safety evaluations and supporting documents to the guidance and methods provided in Nuclear Energy Institute (NEI) 96-07, "Guidelines for 10 CFR 50.59 Evaluations," as endorsed by NRC Regulatory Guide 1.187, "Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments," to determine the adequacy of the safety evaluations.

The team also reviewed a sample of twenty five 10 CFR 50.59 screenings for which Dominion had concluded that no safety evaluation was required. These reviews were performed to assess whether Dominion's threshold for performing safety evaluations was consistent with 10 CFR 50.59. The sample included design changes, calculations, and procedure changes.

The team reviewed the safety evaluations that Dominion had performed and approved during the time period covered by this inspection (i.e., since the last modifications inspection) not previously reviewed by NRC inspectors. The screenings were selected based on the safety significance, risk significance, and complexity of the change to the facility.

In addition, the team compared Dominion's administrative procedures used to control the screening, preparation, review, and approval of safety evaluations to the guidance in NEI 96-07 to determine whether those procedures adequately implemented the requirements of 10 CFR 50.59. The reviewed safety evaluations and screenings are listed in the Attachment.

##### b. Findings

No findings were identified.

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.2 Permanent Plant Modifications (14 samples)  
.2.1 Charging Pump 'A' and 'C' Rotating Assembly Replacement

a. Inspection Scope

The team reviewed a modification (M3-07001) that replaced the 'A' and 'C' charging pump rotating assemblies at Unit 3. The 'B' charging pump had previously failed while in-service, and this modification upgraded the pump shaft with an improved material (Inconel 625). Additional shaft design changes were made as part of the modification to reduce shaft stress.

The team conducted the review to ensure that the design bases, licensing bases, and performance capability of the charging system had not been degraded by the modification. The team reviewed Dominion's implementation of the modification, which included a review of the adequacy of the post-modification test results. The team interviewed the engineering staff regarding the design, installation, and testing of the new rotating assemblies to assess the adequacy of the modification. The team reviewed various documents to verify that the installation was accomplished in accordance with design assumptions and determine if the performance of the charging pumps was acceptable. The team also confirmed that surveillance tests, operational procedures, and drawings had been appropriately updated to reflect the modification. The team reviewed condition reports (CR) and completed surveillance test results to determine if reliability or performance issues resulted from the modification. The 10 CFR 50.59 screening determination associated with this modification was also reviewed as described in section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2.2 Evaluation of Stem Thrust Requirements for 3RHS\*MV8701B/8702A

a. Inspection Scope

The team reviewed a Unit 3 calculation (Report 1824 – Part 39) that was revised to increase the open and close running load limits from 2500 to 5000 pounds on motor-operated valves (MOV) 3RHS\*MV8701B/8702A. The MOVs are residual heat removal system containment isolation valves.

The team conducted the review to ensure that the design bases, licensing bases, and performance capability of the MOVs had not been adversely affected by the calculation revision. The team reviewed various documents to ensure the valves were operated in accordance with design assumptions and instructions. The team reviewed CRs to determine if reliability or performance issues existed with the valves. The 10 CFR 50.59 screening determination associated with this calculation was also reviewed as described in section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

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b. Findings

No findings were identified.

2.3 Replacement of Charging Pump Pulsation Dampeners

a. Inspection Scope

The team reviewed a modification (M2-07002) that replaced the nitrogen filled bladder type pulsation dampeners with liquid filled pulsation dampeners in the discharge piping of the three positive displacement charging pumps at Unit 2. The bladder type dampeners were replaced due to the potential for bladder failure, which could cause gas binding in the charging system.

The team conducted the review to ensure that the design bases, licensing bases, and the performance capability of the charging system had not been adversely affected by the modification. The team reviewed Dominion's installation work orders, which included a review of the adequacy of the post-modification test results. The team interviewed the engineering staff regarding the design, installation, and testing of the new pulsation dampeners to assess the adequacy of the modification. The team walked down the accessible portions of the new equipment to assess the material condition of the system, and to ensure the pulsation dampeners were installed in accordance with design assumptions and instructions. The team also confirmed that surveillance tests, operational procedures, and drawings had been appropriately updated to reflect the design change. The team reviewed CRs and completed surveillance test results to determine if reliability or performance issues resulted from the modification. The 10 CFR 50.59 screening determination associated with this modification was also reviewed as described in section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

2.4 Net Positive Suction Head Available to 3QSS\*P3A,B

a. Inspection Scope

The team reviewed a Unit 3 calculation, P(R)-1062, that was revised to incorporate proposed changes to the refueling water storage tank (RWST) maximum water temperature and to correct the design input for the quench spray (QS) system flow to address a flow assumption deficiency identified in CR-07-06330. The calculation revision documented the net positive suction head (NPSH) available and the associated margin to NPSH required for the QS pumps in support of increasing the maximum RWST temperature to 85 degrees Fahrenheit (°F) (stretch power uprate).

The team conducted the review to ensure that the design bases, licensing bases, and performance capability of the QS system had not been adversely affected by the revision

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to the calculation. The team reviewed the design of the QS system to assess the adequacy of the calculation. The team walked down the accessible portions of the QS system to evaluate the material condition. The team also confirmed that related documents and procedures were updated as necessary to reflect the revision. The team reviewed CRs to determine if reliability or performance issues existed with the QS pumps. The 10 CFR 50.59 screening determination associated with this calculation was also reviewed as described in section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2.5 Reactor Plant Component Cooling System Surge Tank Sizing Calculation

a. Inspection Scope

The team reviewed a Unit 3 calculation, P(R)-711, which was revised to update the reactor plant component cooling water (CCW) surge tank volume based on items such as thermal expansion and contraction, and volume lost due to moderate energy line breaks. The calculation revision also updated the range of CCW system temperature to address the maximum temperature derived in the stretch power uprate of 155°F.

The team conducted the review to ensure that the design bases, licensing bases, and performance capability of the CCW system had not been adversely affected by the revision to the calculation. The team reviewed the design of the CCW system to assess the adequacy of the calculation. The team walked down the accessible portions of the CCW system to evaluate the material condition. The team also confirmed that related documents and procedures were updated as necessary to reflect the revision. The team reviewed CRs to determine if reliability or performance issues existed with the CCW pumps. The 10 CFR 50.59 screening determination associated with this calculation was also reviewed as described in section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2.6 Over-Power Delta Temperature/Over-Temperature Delta Temperature Electronic Filter

a. Inspection Scope

The team reviewed an over-power delta temperature/over-temperature delta temperature (OPDT/OTDT) modification (DM3-00-0189-07) at Unit 3 in which the OPDT rate/lag cards were replaced and reconfigured for the hot leg temperature ( $T_{hot}$ ) signal. The  $T_{hot}$  temperature signal from each reactor coolant system (RCS) hot leg is used to generate the auctioneered high vessel average temperature ( $T_{avg}$ ) and delta temperature protection and control signals. The modification was performed because Unit 3

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observed short duration temperature measurement variations from each of three locally mounted temperature sensors due to fluid stratification within the RCS hot legs.

The team's review was performed to verify that the design bases, licensing bases, and performance capability of the OPDT/OTDT trips had not been degraded by the modification. The team reviewed setpoint calculations and technical evaluations to assess whether the modification was consistent with design assumptions. Modified components were reviewed to ensure that the modification conformed to the design specifications. Design assumptions were reviewed to evaluate whether they were technically appropriate and consistent with the UFSAR. The team also verified selected drawings, calculations, instrument calibration sheets, and procedures were properly updated based on the new system configuration. The team reviewed the post-modification testing, instrument calibration data sheets, and surveillance testing to verify the results indicated the system would function in accordance with design requirements. The team reviewed CRs associated with the system to verify that deficiencies were appropriately identified and corrected. Additionally, the team conducted interviews with engineering staff to verify the affected components functioned in accordance with the design requirements, and to determine if the modification corrected the previously identified problem. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified

.2.7 Pressurizer Level Control Program

a. Inspection Scope

The team reviewed a Unit 3 modification (DM3-00-0298-07) that changed the pressurizer level program as a function of RCS auctioneered high vessel  $T_{avg}$ . The function of the pressurizer level control system is to maintain the pressurizer water level at or near its programmed level as a function of  $T_{avg}$ . The pressurizer level program provides an approximate constant mass inventory in the RCS so that the chemical and volume control system charging rate remains relatively constant during load changes. The modification was performed because there was a change in RCS normal plant operating conditions resulting from the stretch power uprate that caused an increase in shrink and/or swell within the pressurizer during normal plant operations. To accommodate this increased shrink and/or swell, the pressurizer level program as a function of RCS  $T_{avg}$  was revised to provide a wider level control band for the no-load to full load range of RCS  $T_{avg}$  temperatures.

The team's review was performed to verify that the design bases, licensing bases, and performance capability of the pressurizer level control program had not been degraded by the modification. The team reviewed instrument scaling calculations and technical evaluations to assess whether the modification was consistent with design assumptions. Instrument calibration requirements and design assumptions were reviewed to evaluate whether they were technically appropriate and consistent with the UFSAR. The team also verified that selected drawings, instrument calibration sheets, and procedures were

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properly updated based on the new system configuration. The team reviewed the post-modification and surveillance test results to verify proper operation of the system. Finally, the team reviewed CRs associated with the system to verify that deficiencies were appropriately identified and corrected. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2.8 Inadequate Circuit Isolation of Service Water Pump Discharge Motor-Operated Valves 3SWP\*MOV102A and 3SWP\*MOV102C

a. Inspection Scope

The team reviewed a Unit 3 modification (DM3-00-0190-08) that removed the control function from the fire transfer switch panel for the train 'A' service water (SW) pump discharge MOVs 3SWP\*MOV102A and 3SWP\*MOV102C close circuits. Remote control functions for these MOVs were originally needed for post-fire safe shutdown when evacuation of the main control room was required due to a fire. The modification was performed because it was identified that the close circuits associated with these two MOVs passed through the control room area and did not have the required isolation capability. Fire damage to the close circuitry could disable operation of the MOVs from the fire transfer switch panel or it could cause spurious operation of the MOVs. The modification hard-wired the MOV close signals within the control circuits of their respective SW pumps, which eliminated the need to manually close the valves from the fire transfer switch panel. The team's review was performed to verify that the design bases, licensing bases, and performance capability of the close function of MOVs 3SWP\*MOV102A and 3SWP\*MOV102C had not been degraded by the modification. Additionally, the 10 CFR 50.59 screening determination associated with this modification was reviewed as described in section 1R17.1 of this report.

The team assessed if the modification was consistent with requirements in the design and licensing bases. The team reviewed technical evaluations to assess whether the modification was consistent with design assumptions. Elementary wiring diagrams were reviewed to ensure that the modification conformed to the design specifications. The team also verified that selected drawings and procedures were properly updated based on the new equipment configuration. The team reviewed the post-modification and surveillance test results to verify proper operation of the modified MOV circuits. The team reviewed CRs associated with the equipment to verify that deficiencies were appropriately identified and corrected. The team performed a walkdown of the accessible components of the system (i.e., selector switches and valve position indicators on the fire transfer switch panel) to identify any abnormal conditions. Additionally, the team conducted interviews with engineering staff to verify affected systems and/or components functioned in accordance with the design assumptions, and to verify the modification corrected the previously identified problem. The documents reviewed are listed in the Attachment.

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b. Findings

No findings were identified.

2.9 Power-Operated Relief Valve 2-RC-404 Resistance Temperature Detector Relocation and Setpoint Change

a. Inspection Scope

The team reviewed a Unit 2 modification (DM2-03-0128-08) that relocated resistance temperature detector (RTD) TE-114 downstream of power operated relief valve (PORV) 2-RC-404. The function of TE-114 is to provide indication and high temperature annunciation of 2-RC-404 discharge temperature. The modification was performed because the existing location of RTD TE-114 resulted in high temperature readings due to conduction heat transfer between RTD TE-114 and its associated PORV. Specifically, it was a challenge to operators to discern between PORV leakage and conduction heat transfer in the prior configuration. The relocation of the RTD downstream of the PORV also allowed the original annunciator setpoint of 165°F to be restored and provided operations with a more accurate determination of PORV leakage.

The team's review was performed to verify that the design bases, licensing bases, and performance capability of the PORV leakage temperature monitoring configuration had not been degraded by the modification. The team reviewed technical evaluations to assess whether the modification was consistent with design assumptions. Instrument calibration requirements were reviewed to verify that the configuration met the manufacturer's specifications. Design assumptions were reviewed to evaluate whether they were technically appropriate and consistent with the UFSAR. Instrumentation setpoints and scaling were reviewed to ensure design limits were not exceeded. The team verified that selected drawings, instrument calibration sheets, and procedures were properly updated based on the new system configuration; and reviewed the post-modification testing to verify proper operation of the new configuration. The team reviewed CRs associated with the equipment or system to verify that deficiencies were appropriately identified and corrected. The team conducted interviews with engineering staff to verify the modified RTD functioned in accordance with the design assumptions, and to verify the modification corrected the previously identified problem. Additionally, the 10 CFR 50.59 screening determination associated with this modification was reviewed as described in section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

## .2.10 Vital Inverters Replacement

### a. Inspection Scope

The team reviewed a modification (M3-06004) that replaced the existing Unit 3 vital inverters, manual bypass switches, and regulation transformers with new equipment. The 120 Vac vital bus system is designed to supply control and instrument power to plant equipment that is credited in the design bases accident analysis. The vital inverters, regulating transformers, and manual bypass switches are designed to meet this design function by supplying safety-related, regulated, 120 Vac power to the vital instrumentation loads. The modification was performed because the system was in Maintenance Rule (a)(1) status due to frequent functional failures. The existing inverters and their associated equipment were becoming unreliable, and many of the components within the inverters were obsolete.

The team's review was performed to verify that the design bases, licensing bases, and performance capability of the new vital inverter system had not been degraded by the modification. The team reviewed calculations and technical evaluations, and interviewed engineering staff, to assess whether the modification was consistent with design assumptions. Power requirements were reviewed to verify that the equipment met the manufacturer's specifications and did not adversely affect other support systems. Replacement components and materials were reviewed to ensure that the modification conformed to the design specifications. Design assumptions were reviewed to evaluate whether they were technically appropriate and consistent with the UFSAR. Supporting electrical calculations and analyses for the loading and sizing requirements were reviewed to ensure design limits were not exceeded. The team also verified that selected drawings, calculations, and procedures were properly updated based on the new equipment configuration. The team reviewed the post-modification and surveillance test results to verify proper operation of the new vital inverter system. The team reviewed CRs associated with the system to verify that deficiencies were appropriately identified and corrected. The team performed a walkdown of the accessible components of the system to identify any abnormal conditions and to verify proper operation of the system while in-service. Additionally, the 10 CFR 50.59 screening determination associated with this modification was reviewed as described in section 1R17.1 of this report. The documents reviewed are listed in the attachment.

### b. Findings

No findings were identified.

## .2.11 Removal of Check Valve 2-CS-26 Internals and Relocation of TS-2542

### a. Inspection Scope

The team reviewed a Unit 2 modification (DM2-00-0152-07) that removed the internal components of check valve 2-CS-26 and also relocated and replaced an existing temperature switch (TS-2542) assembly (i.e., thermostat, capillary tube, sensing bulb) in the associated piping with a new assembly. The check valve was located in the

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minimum flow return line to the RWST. It had a passive safety function as a pressure boundary and a design function to prevent back flow from the RWST to the high and low pressure emergency core cooling systems (ECCS) and the containment spray (CS) system. Dominion implemented this modification after determining that a failure of this valve to open could result in insufficient minimum recirculation flow and a loss of ECCS and CS pumps during certain postulated scenarios. Additionally, the back flow protection that this valve provides was redundant. Relocation of TS-2542 and its sensing bulb was to improve the effectiveness of the electric heat tracing circuit.

The team reviewed the modification to verify that the design bases, licensing bases, and performance capability of the ECCS and CS systems had not been degraded by the modification. The team reviewed the documentation supporting Dominion's evaluation that determined it was acceptable to remove the check valve's internals to assess its adequacy. The team reviewed Dominion's maintenance activities and post-modification testing results to verify proper setpoint and calibration of the temperature switch. The team verified calculations, drawings, procedures, and design bases documents were updated to reflect the modification. The team also interviewed engineering staff and conducted a walkdown of the RWST tank area and the 2-CS-26 valve to identify any abnormal conditions and determine if the material condition was acceptable. The 10 CFR 50.59 screening determination associated with this modification was reviewed as described in section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

2.12 EDG Operating Time with 24,000 Gallons of Ultra Low Sulfur Diesel Fuel

a. Inspection Scope

The team reviewed a Unit 2 calculation (DM2-00-0042-07) that was revised to determine the length of time that the emergency diesel generators (EDG) could operate at the continuous rated load of 2750 kW utilizing a maximum of 24,000 gallons of fuel, which was the amount of fuel required to be stored in the diesel fuel oil supply tanks as per the Unit 2 TSs. The modification was implemented to calculate any changes to engine fuel oil consumption rates or run times due to the use of ultra low sulfur diesel fuel.

The team assessed whether the modification was consistent with assumptions in the design and licensing bases. The team reviewed the associated revision and discussed the calculation with the responsible design engineer to verify the assumptions were appropriate. The team conducted a walkdown of the EDG enclosures to assess material condition. Additionally, the 10 CFR 50.59 screening determination associated with this modification was reviewed as described in section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2.13 Addition of Instrumentation Pulsation Dampeners

a. Inspection Scope

The team reviewed a Unit 3 modification (DM3-00-1598-96) that upgraded the material of instrumentation line pressure pulsation dampeners (snubbers). The snubbers provide pressure dampening and filtering to prevent damage to associated pressure gauges or transmitters. The modification was performed as a revision to add a commercial grade, seismically rugged, non-environmentally qualified item for purchase and dedicated use. This item was an upgrade to previous snubber installations in various pressure indicator sensing lines where gauges/instruments have required frequent replacement and extended out-of-service time due to excessive wear caused by pressure pulsations.

The review was performed to verify that the design bases, licensing bases, and performance capability of the pressure-sensing instrumentation had not been degraded by the modification. The team reviewed technical evaluations to assess whether the modification was consistent with design assumptions. The modification requirements and procurement receipt documentation were reviewed to verify the components met the manufacturer's specifications, material codes, non-magnetic requirements, and dimensions. The team conducted interviews with engineering staff to verify that the affected pressure instrumentation functioned in accordance with the design assumptions and to verify that the modification corrected the previously identified problem. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2.14 Service Water Pump Strainer Backwash Piping to Alternate Bay – Operating Procedure

a. Inspection Scope

The team reviewed a revision to the Unit 2 system operating procedure OP 2326D, "Service Water Pump Strainer Backwash Piping to Alternate Bay." The purpose of this procedure modification was to 1) reconfigure the SW pump strainer backwash piping from its normal discharge path to an alternate discharge path, to be used during concurrent SW bay draining, cleaning or other maintenance; and 2) to add a compensatory operator action during the alternate discharge piping tie-in activity.

The team's review was performed to verify that the design bases, licensing bases, and performance capability of the service water system had not been degraded by the modification. The team reviewed system operating procedures, related maintenance activities, and surveillance and post maintenance test results to assess whether the modification was consistent with design assumptions. The team conducted interviews

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with engineering staff to verify the intent and adequacy of the modification, and to verify that modification corrected the previously identified problem. The team performed a walkdown of the Unit 2 intake structure and accessible components of the system to identify any abnormal conditions and to verify proper operation of the equipment while in-service. The documents reviewed are listed in the Attachment.

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 CRs associated with 10 CFR 50.59 and plant modification issues to determine whether Dominion was appropriately identifying, characterizing, and correcting problems associated with these areas, and whether the planned or completed corrective actions were appropriate. In addition, the team reviewed CRs written on issues identified during the inspection to verify adequate problem identification and incorporation of the problem into the corrective action system. The CRs reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4OA6 Meetings, including Exit

The team presented the inspection results to Mr. A. J. Jordan, Site Vice President, and other members of Dominion's staff at an exit meeting on November 18, 2010. The team returned the proprietary information reviewed during the inspection and verified that this report does not contain proprietary information.

**ATTACHMENT**

**SUPPLEMENTAL INFORMATION**

**KEY POINTS OF CONTACT**

Dominion Personnel

D. Bajumpaa, Design Engineer  
B. Burnham, Senior Engineer  
T. Cleary, Licensing Engineer  
K. Cyr, Senior Engineer  
W. Faye, Design Engineer  
N. Jaycox, Sr. Mechanical Project Engineer  
D. MacNeill, Design Engineering Supervisor  
D. Robinson, Senior Engineer  
J. Roddy, Project Engineer  
R. Ryan, Procurement Engineering Technical Specialist  
L. Salyards, Licensing Engineer  
R. Sterner, Senior Engineer

**LIST OF ITEMS OPENED, CLOSED AND DISCUSSED**

None.

**LIST OF DOCUMENTS REVIEWED**

10 CFR 50.59 Evaluations

S2-EV-07-0001, Safety Evaluation for Procedure OP 2326D (SW Pump Strainer Backwash Piping to Alternate Bay), Rev. 0  
S2-EV-08-0001, Safety Evaluation for Procedure OP 2304H (Boric Acid Addition to CVCS from SFP Cask Laydown Pit), Rev. 0  
S2-EV-08-0002, Safety Evaluation for Main Steam Line Break Dose Analysis, Rev. 2  
S2-EV-08-0004, Safety Evaluation for LBDCR 07-MP2-010 (TRM Change for Adoption of Functionality Definition and Elimination of Shutdown Requirements), Rev. 0  
S2-EV-09-0001, Safety Evaluation for UFSAR Change Request MP2-UCR-2009-002, Rev. 0  
S2-EV-09-0002, Safety Evaluation for Temporary Change MMOD DM2-00-0200-09, Rev. 0  
S2-EV-09-0003, Safety Evaluation for In-Core Instrument Thimble Tube Replacement, Rev. 0  
S3-EV-07-0001, Safety Evaluation for Planned High Burnup of One Lead Test Assembly, Rev. 0  
S3-EV-09-0001, Safety Evaluation for FSC MP3-UCR-2009-007 (UFSAR Update to Reflect Change in the Calculated Maximum Containment Liner Temperature), Rev. 0

10 CFR 50.59 Screened-out Evaluations

AOP 2572, Loss of Non-Vital Instrument Panel VR-11, Rev. 009-05  
 AOP 3561, Loss of Reactor Plant CCW, Rev. 11-00  
 DCN DM2-00-0031-07, Lower 4160 Vac Vital Switchgear Replacement Cooling Coil, Rev. 0  
 DCN DM2-00-0192-07, Pressure Gauges for EDG Heat Exchangers, Rev. 0  
 DCR M3-07022, Temperature Re-Rate of the CCW System, Rev. 0  
 DCR M3-08010, Procedure Change for AFW Transition to a Main Feedwater Pump, Rev. 0  
 DM2-00-0039-10, Letdown Temperature Controller TIC-223 Replacement, Rev. 0  
 DM2-00-0243-07, Replacement of Annunciator Ground Detector Switches, Rev. 0  
 DM2-00-0254-08, 125 Vdc Distribution Panel DV20 Undervoltage Relay Replacement, Rev. 0  
 DM3-00-0078-08, Revision to EDG Air Dryer Control Timer Logic, Rev. 0  
 DM3-00-0320-08, Removal of 'A' and 'B' Turbine-Driven Feed Pump Oil Pressure Switches  
 3TFC-PS37A 3TFC-PS37B, Rev. 0  
 DM3-00-0410-08, Change Process Setpoint and Instrument Channel Error for 3FWA\*PS52A,  
 3FWA\*PS52B, and 3FWA\*PS52C, Rev. 0  
 Field Change Procedure Form for OP 3304A (Charging and Letdown), Rev. 030-09, FCN #1  
 M2-08006, Control Wiring for Charging Pumps, Rev. 00  
 OP 2347D, Backfeeding Unit 2, Rev. 016-04

Modification Packages

\*DM2-00-0042-07, EDG Operating Time with 24,000 Gallons of Ultra Low Sulfur Diesel Fuel Oil  
 Available at Continuous Load of 2750 kW, Rev. 4  
 \*DM2-00-0152-07, Removal of Check Valve 2-CS-26 Internals and Relocate Heat Trace  
 Controlling Temperature Switch TS-2542, Rev. 0  
 \*DM2-03-0128-08, PORV 2-RC-404 RTD TE-114 Relocation and Setpoint Change, Rev. 3  
 \*DM3-00-0190-08, Inadequate Circuit Isolation of 3SWP\*MOV102A, 3SWP\*MOV102C, Rev. 0  
 \*Evaluation of Stem Thrust Requirements for 3RHS\*MV8701B, 3RHS\*MV8702A, Rev. 1  
 \*M2-07002, Replacement of Unit 2 Charging Pump Discharge Pulsation Dampeners, Rev. 0  
 \*M3-06004, Vital Inverters Replacement, Rev. 0  
 \*M3-07001, MP3 'A' and 'C' Charging Pump Rotating Assembly Replacement, Rev. 1  
 \*P(R)-1062, Net Positive Suction Head Available to 3QSS\*P3A & B, Rev. 1  
 \*P(R)-711, Reactor Plant Component Cooling System Surge Tank Sizing, Rev. 1  
 DM3-00-0189-07, T<sub>hot</sub> Signal Filter and Rate/Lag Cards to T<sub>hot</sub> Filters, Rev. 0  
 DM3-00-0298-07, Pressurizer Level Control Program, Rev. 0  
 DM3-00-1598-96, Addition of Pulsation Dampeners to 3IAS-PI18A and 3IAS-PI18B, Rev. 0  
 OP 2326D, SW Pump Strainer Backwash Piping to Alternate Bay, Rev. 2

(\* designates a modification and 10 CFR 50.59 screened-out evaluation sample)

Calculations and Analyses

120E, AC Cable Size Verification - Vital Bus Feeders, Rev. 2  
 12179-C10.709, Equipment Pad Control Building, Rev. 0  
 151E, Panel Loading for Class 1E and Non-Class 1E Channels 1-4, Rev. 1  
 177E, 120 Vac System Short Circuit Study, Rev. 01  
 182E, 120 Vac System Voltage Profile, Rev. 1

211E, Voltage Verification for 120V Vital Bus Circuits, Class 1E, Revs. 0 and 1  
 31024-01674E3, MP3 Component Response Time Acceptance Criteria, Rev. 0  
 3442C10-01215E3, Calibration Data - Pressurizer Pressure Channel Calibration, Rev. 2  
 3469N08-0435213, 3RCS-TY412B Pressurizer Level Control Program Scaling, Rev. 0  
 3-ENG245, Delta T/T<sub>avg</sub> Channel Calibration Data, Rev. 13  
 91-BOP-813-ES, MP2 EDG Operating Time with 24,000 Gallons of Diesel Fuel Oil Available at  
 Continuous Rated Load of 2750 kW, Rev. 4  
 97-122, ECCS System Analysis, Rev. 3  
 ATJ-003, Alternate Test Justification for 2-CH-177, Rev. 2  
 BAT1-96-1241E3, Battery 1 and Charger, Associated Cable and Device Verification, Rev. 2  
 BAT2-96-1243E3, Battery 2 and Charger, Associated Cable and Device Verification, Rev. 2  
 BAT3-96-1245E3, Battery 3 and Charger, Associated Cable and Device Verification, Rev. 0  
 BAT4-96-1246E3, Battery 4 and Charger, Associated Cable and Device Verification, Rev. 0  
 Bechtel 040A, Containment Spray Test Header to RWST, Stress Problem 40A, Rev. 04  
 COMBLOAD-1325M3, Determination of Fire Severity for Fire Protection Report, Rev. 0  
 EVAL-ENG-RSE-M2C20, Reload Safety Evaluation Millstone Unit 2 Cycle 20, Rev. 1  
 LEAD/LAG-01206E3, Calibration Data - RPS/ESFAS Lead/Lag, Rate Lag Compensators, Rev. 1  
 MP3-ENG-ETAP-04125E3, MP3 Electrical Distribution System Analysis, Rev. 0  
 NI-033, EDG Load Start KVA Calculation, Rev. 4  
 NUS-A134SA, Equivalency Review of the PID 901-540 to the GE/MAC Type 540-01, Rev. 1  
 PRA02NQA-03131S2, MP2 Impact on Containment Release Frequencies, Rev. 2  
 SBO-COPE-1440E3, Battery Size Calculation for Eight-Hour SBO for Millstone Unit 3, Rev. 1

Corrective Action Documents (\* denotes NRC identified during this inspection)

06-09303	09000010	150042	337762	388281
07-06330	10001120	173253	344309	390469
07-08295	114592	175909	344386	393157
07-09464	116014	181074	354072	401952
08-00749	116736	318737	355006	403897*
06002757	117113	324869	382515	403932*
08000102	125619	330927	386459	404663*
08000442	143621	333673	386963	97021449

Drawings

0253-366189-002, 1 ¼-Wh260 Socket-Weld Thermowell, Rev. 3  
 25203-20150, Containment Spray Test Header to RWST HCD(C) ISO, Sh. 698, Rev. 8  
 25203-20150, MPS2 BCA-2 Pressurizer Relief Discharge to Quench Tank, Sh. 1075, Rev. 1  
 25203-20150, Pressurizer Safety and Relief Valve Discharge to Quench Tank, Sh. 366, Rev. 17  
 25203-20219, MPS2 Pressurizer Safety and Relief Valve Discharge Piping, Sh. 1, Rev. 5  
 25203-26015, High Pressure Safety Injection Pumps, Sh. 2, Rev. 39  
 25203-26017, Boric Acid System, Sh. 3, Rev. 43  
 25203-26023, Spent Fuel Pool Cooling and Cleanup System, Sh. 2, Rev. 30  
 25203-28500, MPS2 TE-114 Train 'B' Pressurizer to Quench Tank Loop Diagram, Sh. 74, Rev. 1  
 25203-28500, MPS2 TT-223 Letdown Heat Exchanger X22 Loop Diagram, Sh. 222, Rev. 4

25203-29042, 150 Stainless Steel Bolted Bonnet Swing Check Valve, Sh. 14, Rev. C  
 25203-37005, Block Diagram Electric Freeze Protection, RWST, T-41, Sh. 99, Rev. 3  
 25212-28965, Press Instr-Air Serv Instr Below Tap, Press 150 psig & Below, Sh. 1, Issue 3  
 473-1, Reactor Plant Component Cooling Surge Tank Mark No. 3CCP-TK1, Rev. 4

### Procedures

AOP 2572, Loss of Non-Vital Instrument Panel VR-11, Rev. 009-05  
 C SP750, Battery Weekly and Quarterly Surveillance, Rev. 002-02  
 DCM 03, Plant Changes, Rev. 017-01  
 DNAP-3004, Program for 10 CFR 50.59 and 72.48 – Changes, Tests, and Experiments, Rev. 4  
 EN 21221, MP2 Check Valve Inspections, Rev. 003-01  
 IC 3469N08, Rod Control Speed and Control  $T_{ave}$  Alarm Data Sheet, Rev. 002-03  
 IC 3469N08, Rod Control Speed and Control  $T_{ave}$  Alarms, Rev. 004-01  
 IC 3469N08, Rod Control Speed and Control  $T_{ave}$  Auctioneered/Deviation Alarms, Rev. 004-01  
 LI-AA-301, Implementation of 10 CFR 21, Reporting of Defects and Noncompliance, Rev. 0  
 MP 2721W, SFP Gate Maintenance and Movement, Rev. 008  
 MP 3746XA, Charging Pump Maintenance, Rev. 006-05  
 MP-03-DCC-GDL02, Temporary Plant Changes (Superseded), Rev. 002  
 OP 2304E, Charging Pumps, Rev. 017-01  
 OP 2304E11, 'A' Charging Pump Maintenance, Rev. 001  
 OP 2304H, Boric Acid Addition to CVCS from SFP Cask Laydown Pit, Rev. 001-01  
 OP 2305B, RWST Purification, Rev. 000-02  
 OP 2309X11, 'A' Containment Spray Pump IST for New Baseline, Rev. 000-02  
 OP 2309X21, 'B' Containment Spray Pump IST for New Baseline, Rev. 000-02  
 OP 2326D, Service Water Pump Strainer Backwash Piping to Alternate Bay, Rev. 000-02  
 OP 2354D, Draining ECCS Components and Piping, Rev. 000-08  
 OP 3353.MB1C, Main Control Board 1C Annunciator Response, Rev. 005-15  
 OP 3353.MB8A, Inverter 1 Trouble, Rev. 002-10  
 OP-2326A, Service Water System, Rev. 023-07  
 OP2347D, Backfeeding Unit 2, Rev. 016-04  
 OP-AA-100, Administrative Procedure: Conduct of Operations, Rev. 10  
 OP-AA-102-1001, Development of Technical Basis to Support Operability Determinations, Rev. 2  
 PI-AA-200, Corrective Action, Rev. 14  
 SP 21236, Disassembly and Stroke Testing of Check Valves in the IST Program, Rev. 001-05  
 SP 2601J, CVCS Check Valve Tests, Rev. 004-09  
 SP 2606I, High Flow Inservice Testing of 'A' CS Pump and Check Valves, Rev. 000-02  
 SP 2606J, High Flow Inservice Testing of 'B' CS Pump and Check Valves, Rev. 000-02  
 SP 3442D01, Pressurizer Water Level Calibration, Rev. 010-05  
 SP 3604A.1, Charging Pump 'A' Operational Readiness Test, Rev. 014  
 SP 3604A.3, Charging Pump 'C' Operational Readiness Test, Rev. 011-04

### Completed Surveillance & Functional Test Procedures

3CHS\*P3A, Operational Readiness Test (Two Charging Pumps Aligned for Service) (3/18/08,  
 5/15/08, 8/17/08, 1/21/09, 4/15/09, 3/24/10)  
 C SP750, Unit 3 – Battery Quarterly Inspection (10/6/10)  
 CPT 1407A-001, Ametek Inverter Meter Calibration Data Sheet (10/24/08)

IC 2418B, Pressurizer Relief Valve Temperature Input Loops Calibration Data Sheet (11/2/09)  
 IC 2429D3, RWST Cold Weather Preparations Instrument Calibration Data Sheet (4/23/08)  
 IC 3469N08-001, Rod Control Speed and Control Tave Alarm Data Sheet (10/19/05, 5/05/07)  
 MA-AA-102, Foreign Material Exclusion Evaluation on M2L1A (4/14/10)  
 MA-AA-102, Foreign Material Exclusion Evaluation on M2L1C (2/9/10)  
 MP 2701P, Outside Tank Freeze Protection Heat Trace Inspection (4/21/08)  
 MP 2702C9, Pacific Bolted Bonnet Swing Check Valve Overhaul (4/20/08)  
 MP-20-WP-GDL40, PMT Plan for 2-CS-26 Internals Removal (4/25/08, 5/10/08)  
 OP 2326A-002, Service Water Alignment Verification, Facility 2 (2/15/10, 4/14/10)  
 SP 2612B-003, 'C' SW Pump and Facility 2 Discharge Check Valve IST (2/15/10)  
 SP 3442A10-001, Delta T/T<sub>avg</sub> Channel 1 Calibration Data Sheet (10/23/08)  
 SP 3442A20-001, Delta T/T<sub>avg</sub> Channel 2 Calibration Data Sheet (10/24/08)  
 SP 3442A30-001, Delta T/T<sub>avg</sub> Channel 3 Calibration Data Sheet (10/22/08)  
 SP 3442A40-001, Delta T/T<sub>avg</sub> Channel 4 Calibration Data Sheet (10/27/08)  
 SP 3442C10-001C, Pressurizer Pressure Channel 1 Heater Control/Deviation Alarm (10/17/08)  
 SP 3442C10-001R, Pressure Input to OTDT Setpoint: Protection 1 (10/23/08)  
 SP 3442C20-001R, Pressurizer Pressure NR Channel 2 Rack Calibration Data Sheet (10/24/08)  
 SP 3442C30-001R, Pressurizer Pressure NR Channel 3 Rack Calibration Data Sheet (10/22/08)  
 SP 3443A21-001, Protection Set Cabinet 1 Operational Test Data Sheet (11/1/08)  
 SP 3443B21-001, Protection Set Cabinet 2 Operational Test Data Sheet (11/3/08)  
 SP 3443C21-001, Protection Set Cabinet 3 Operational Test Data Sheet (10/31/08)  
 SP 3443D21-001, Protection Set Cabinet 4 Operational Test Data Sheet (11/4/08)  
 SP 3673.2-009, Fire Transfer Switch Panel Operational Testing – 3SWP\*MOV102A and  
 3SWP\*MOV102C (9/17/08)  
 SPROC ENG07-3-001, DCR M3-06004 Inverter Replacement (4/27/07)  
 SPROC OPS 09-2-01, Post-Modification Test of Unit 2 Charging Pumps After Pulsation  
 Dampeners Installation (8/26/09, 9/18/09)

#### Work Orders

53102184534	53102354613	53M30711650	M3 0415663
53102231909	53M20807011	53M30711913	M3 0513631
53102285155	53M30711647	53M30711914	M3 0703895
53102317677	53M30711648	M2 0709960	
53102333892	53M30711649	M2 97173	

#### Vendor Technical Documents

25212-MP3-SFR, Safety Functional Requirements Manual, Rev. 5 and 6  
 53805-1, Certification Test Report for Seismic Testing of a 25 KVA DC Inverter, 'A' 25 KVA  
 Isolimiter, and a 25KVA Remote Manual Switch, 9/25/06  
 25203-300-050A, Type 540 Series Controllers, 9/18/97

#### Miscellaneous

Audit 10-03, Engineering Programs and Design Control, 8/19/10  
 Coltec Engineering Report R5.08-0545, Fuel Consumption Rates for MP2 EDG Sets, 12/16/93  
 DOE, Energy Information Administration: The Transition to Ultra-Low-Sulfur Diesel Fuel, 2/23/07



IEEE 1000008924, Controller, GE/MAC 540, Scientech PID 901-540/Millstone Unit 2, Rev. 0  
Material Receipt Inspection Report Package, Material Document # 4900035050-08, Inspection  
Instructions and Results for ½" Pressure Snubber – Stainless Steel, 1/30/08  
Material Receipt Inspection Report Package, Material Document # 4900208598-08, Inspection  
Instructions and Results for ½" Pressure Snubber – Stainless Steel, 6/10/08  
Material Receipt Inspection Report Package, Material Document # 4900286943-08, Inspection  
Instructions and Results for ¼" Pressure Snubber – Monel, 8/14/08  
Material Receipt Inspection Report Package, Material Document # 5000196711, Inspection  
Instructions and Results for ¼" NPT Pulsation Dampener - Brass, 9/19/07  
MP-14-OPS-GDL600, Plant Status and Configuration Control, Rev. 004  
Part 21 Notification 2010-28-00, EDG Inoperable in Excess of Technical Specifications  
Completion Time Due to Output Breaker Failure, 6/1/10  
PDCR MP3-94-103, Snubber Installation in Various Pressure Indicator Sensing Lines, Rev. 0  
PTE 9004748-V01, M3708761 - Snubber, Pressure, Stainless Steel, 12", Revision to Add  
M3708761 to Evaluation and Inspection Plan 1257, 1/30/08  
PTE 9004748-V02, Upgrade of M370876R to 42124455 – Snubber, Pressure, Stainless Steel,  
12", Revision to Add 42124455 to Evaluation and Inspection Plan 1257, 6/10/08

Design and Licensing Bases

DBS-2350, Refueling Water Storage Tank & Containment Sump System, Rev. 0  
DBS-2415, MPS2 Inadequate Core Cooling and In-Core Instrumentation Systems, Rev. 0  
DM2-00-0200-09, Temporary Credit for Local Manual Action Outside Control Room, RWST  
Purification Sub-system, 10/1/09  
SP-EE-076, Standard Specification for Electrical Installation, Rev. 7  
SP-M2-EE-002, Attachment M, TI-106, 107, 108 and 114 Specific Indicator Configuration  
Parameters and Features, Rev. 2

## LIST OF ACRONYMS

°F	Degrees Fahrenheit
ADAMS	NRC Document System
CCW	Component Cooling Water
CFR	Code of Federal Regulations
CR	Condition Report
CS	Containment Spray
DRS	Division of Reactor Safety
ECCS	Emergency Core Cooling Systems
EDG	Emergency Diesel Generator
IP	Inspection Procedure
kW	kilo-Watts
MOV	Motor-Operated Valve
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NPSH	Net Positive Suction Head
OPDT	Over-Power Delta Temperature
OTDT	Over-Temperature Delta Temperature
PARS	Publically Available Records
PORV	Power Operated Relief Valve
QS	Quench Spray
RCS	Reactor Coolant System
RTD	Resistance Temperature Detector
RWST	Refueling Water Storage Tank
SW	Service Water
$T_{avg}$	Average Temperature
$T_{hot}$	Hot Leg Temperature
Vac	Volts, Alternating Current
UFSAR	Updated Final Safety Analysis Report



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PA 19406-1415

December 23, 2010

MN No. 11-001

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I  
NOTICE OF LICENSEE MEETING

Licensee: Dominion Nuclear Connecticut, Inc.

Facility: Millstone Power Station Unit 2 and 3

Docket Nos: 50-336, 50-423

Date/Time: January 6, 2011  
10:00 a.m. to 12:00 p.m.

Location: NRC Region I Office, Public Meeting Room  
475 Allendale Road  
King of Prussia, PA 19406

Purpose: Dominion Nuclear Connecticut, Inc. requested a Regulatory Conference with the NRC to discuss a potential greater-than-Green security-related NRC identified finding identified on August 18, 2010. The nature of security-related greater-than-Green findings is considered to be sensitive information and is not included in this notice.

Category: This meeting will be closed to the public because the staff has determined that the information is security-sensitive in nature.


Attendees:

NRC: W. Dean, Regional Administrator, Region I  
D. Roberts, Director, Division of Reactor Safety, Region I  
J. Trapp, Chief, Plant Support Branch 1, Region I  
D. Jackson, Chief, Projects Branch 5, Region I  
D. Holody, Team Leader, Enforcement, Region I  
M. McLaughlin, Senior Enforcement Specialist, Region I  
J. Willis, Security Specialist, Office of Nuclear Security and Incident Response  
K. Farrar, Regional Counsel, Region I  
D. Caron, Senior Physical Security Inspector, Region I  
J. Cherubini, Physical Security Inspector, Region I

Licensee: A.J. Jordan, Site Vice President  
R. MacManus, Director Nuclear Safety and Licensing  
W. Bartron, Supervisor Licensing  
J. Curling, Manager of Nuclear Protection Services  
M. Brown, Supervisor, Security Operations  
L. Hart, Vice President Nuclear Support Services  
P. Blasioli, Director Nuclear Protection Services and Emergency Preparedness  
N. Martin, Manager Nuclear Fleet Protection Services

Meeting Contact: James M. Trapp, Chief, Plant Support Branch 1  
610-337-5186  
E-mail: James.Trapp@nrc.gov

Handicapped persons requiring assistance to attend the meeting shall make their requests known to the NRC meeting contact no later than 2 business days prior to the meeting. Attendance by NRC personnel at this meeting should be made known by December 27, 2010, via telephone to the NRC meeting contact.

Approved By:  for  
James M. Trapp, Chief  
Plant Support Branch 1  
Division of Reactor Safety

cc w/encl: Distribution via ListServ

# Agenda

Regulatory Conference

Millstone Power Station

January 6, 2011  
10:00 am – 12:00 pm

Introductions ..... NRC (5 minutes)  
Discussion of Regulatory Process..... NRC (5 minutes)  
SDP Determination .....NRC (10 minutes)  
Dominion Staff Provides Additional Information ..... Millstone (60 minutes)  
NRC Questions and Dialogue ..... Millstone (30 minutes)  
Closing Remarks ..... NRC (10 minutes)



Distribution w/encl: (via email)

Executive Director for Operations, OEDO	(RIDSEDOMAILCENTER RESOURCE)
Deputy Executive Director for Reactor Programs, OEDO	(RIDSEDOMAILCENTER RESOURCE)
Director, Office of Nuclear Reactor Regulation, NRR	(RIDSNRROD)
Associate Director, Office of Operating Reactor Oversight and Licensing, NRR/ADRO	(RIDSNRRADRO)
Director, Division of Inspection and Regional Support, NRR/DIRS	(RIDSNRRDIRS)
Director, Division of Operating Reactor Licensing, NRR/DORL	(RIDSNRRDORL)
Project Directorate I-1 (PD1/2), NRR	(RIDSNRRDORILPI 1-2)
Asst. General Counsel Materials Litigation and Enforcement, OGC	(RIDSOGCMAILCENTER)

W. Dean, RA	(R1ORAMAIL RESOURCE)
M. Dapas, DRA	(R1ORAMAIL RESOURCE)
D. Lew, DRP	(R1DRPMAIL RESOURCE)
J. Clifford, DRP	(R1DRPMAIL RESOURCE)
D. Roberts, DRS	(R1DRSMAIL RESOURCE)
P. Wilson, DRS	(R1DRSMAIL RESOURCE)
D. Jackson, DRP	
T. Setzer, DRP	
D. Dodson, DRP	
S. Shaffer, DRP, SRI	
B. Haagensen, RI	
J. Krafty, DRP, RI	
C. Kowalyshyn, OA	
G. Miller, RI OEDO	
D. Bearde, DRS	
RidsNRRPM Millstone Resource	
RidsNRRDorILp1-2 Resource	
ROPreportsResource@nrc.gov	
RI Receptionist	



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

January 6, 2011

EA-10-175  
EA-10-227

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

SUBJECT: MILLSTONE POWER STATION RESPONSE TO NRC INSPECTION REPORTS  
05000336/201008 AND 05000423/2010011

Dear Mr. Heacock:

Thank you for your letters of December 6, 2010, (ML103410252 and ML103490464) that provided your response to two notices of violation transmitted in our November 4 and November 5, 2010, letters (ML0103090613 and ML103090062). We will review the implementation of your corrective actions during a future inspection to determine that full compliance has been achieved and will be maintained.

In accordance with Title 10 of the Code of Federal Regulations, Part 2.390 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspections 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 Web Site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

A handwritten signature in black ink that reads "John F. Rogge".

John F. Rogge, Chief  
Engineering Branch 3  
Division of Reactor Safety

cc: Distribution via ListServ



EA-10-175  
EA-10-227

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

SUBJECT: MILLSTONE POWER STATION RESPONSE TO NRC INSPECTION REPORTS  
05000336/201008 AND 05000423/2010011

Dear Mr. Heacock:

Thank you for your letters of December 6, 2010, (ML103410252 and ML103490464) that provided your response to two notices of violation transmitted in our November 4 and November 5, 2010, letters (ML0103090613 and ML103090062). We will review the implementation of your corrective actions during a future inspection to determine that full compliance has been achieved and will be maintained.

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Sincerely,

/RA/

John F. Rogge, Chief  
Engineering Branch 3  
Division of Reactor Safety

cc: Distribution via ListServ

Distribution:

D. Roberts, DRS (R1DRSMAIL  
RESOURCE)  
P. Wilson, DRS (R1DRSMAIL RESOURCE)  
J. Clifford, DRP  
G. Dentel, DRP  
D. Jackson, DRP

S. Shaffer, DRP, SRI  
J. Krafty, DRP, RI  
B. Haagensen, RI  
A. DeFrancisco, ORA  
D. Holody, ORA  
G. Gulla, OE

**SUNSI Review Complete: \_\_jfr\*\_\_ (Reviewer's Initials)**

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

January 14, 2011

EA-10-142  
EA-10-230

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

SUBJECT: NRC INVESTIGATION REPORT NOS. 1-2010-024 AND 1-2010-028;  
MILLSTONE POWER STATION

Dear Mr. Heacock:

This letter refers to two investigations initiated by the U.S. Nuclear Regulatory Commission's (NRC) Office of Investigations (OI) at Millstone Power Station (MPS). The investigations, 1-2010-024, and 1-2010-028, were initiated on March 11 and March 25, 2010, respectively, to determine whether two different contract employees deliberately failed to report an arrest on unescorted access authorization (UAA) records to gain unescorted access (UA) at MPS. Both investigations were initiated after MPS identified these issues and brought them to the attention of the NRC.

As a result of the first investigation, 1-2010-024, the NRC did not substantiate that the contract employee deliberately failed to report an arrest leading to UA at MPS. Specifically, on February 8, 2010, while applying for UA at MPS, the contract employee checked a "no" block on a Personal History Questionnaire (PHQ) form indicating that he/she had no arrests, detentions, or reportable alcohol-related incidents. On February 10, 2010, the contract employee indicated to a supervisor that he/she had been detained by police on December 27, 2009, but did not believe this amounted to an arrest that was required to be reported on the UAA records at MPS. The contract employee's supervisor determined that this issue was required to be reported when the contract employee applied for UA at MPS, and notified MPS of the issue. The contract employee's UA at MPS was subsequently revoked by MPS access personnel.

The OI investigation concluded that the individual had demonstrated evidence to support his/her claim that he/she did not fully understand the PHQ questions, which led him/her to believe that the incident with police on December 27, 2009, was not required to be reported. Additionally, the investigators did not feel that the contract employee's behaviors and actions were consistent with an individual trying to intentionally conceal a failure to report an arrest to gain UA at MPS. Therefore, since the actions of the contract employee were not found to be deliberate, the contract employee did not violate the NRC's deliberate misconduct rule (10 CFR 50.5), which prohibits employees from engaging in deliberate misconduct that would cause a licensee to be in violation of any NRC requirements.

As a result of the second investigation, 1-2010-028, the NRC determined that the second contract employee deliberately falsified UAA records to gain access to MPS. Specifically, on February 9, 2010, the contract employee failed to report a December 13, 2009, arrest when completing the PHQ form for UA at MPS. The contract employee admitted that when he/she filled out the PHQ for UA, he/she knew that the arrest should have been reported. The contract employee's supervisor determined that this issue was required to be reported when the contract employee applied for UA at MPS, and notified MPS of the issue. MPS access personnel subsequently revoked the contract employee's UA. Since the actions of the contract employee were deliberate, the contract employee violated the NRC's deliberate misconduct rule (10 CFR 50.5), which prohibits employees from engaging in deliberate misconduct that would cause a licensee to be in violation of any NRC requirements.

The NRC determined that in both investigations, the two contract employees completed and submitted PHQs on which they failed to report arrests, causing MPS, in each case, to be in violation of NRC requirements, specifically: 1) 10 CFR 50.9, which requires, in part, that documentation required to be maintained by the licensee be complete and accurate in all material respects; and, 2) Section 9.1 of the MPS Physical Security Plan (PSP), which states that the MPS access authorization program will implement the regulatory requirements, utilizing the provisions in NEI-03-01, Revision 2, "Nuclear Power Plant Access Authorization Program." NEI 03-01, Rev. 2, Section 7.2, "Personal History Questionnaire," in part, requires each individual applying for UAA/UA to provide a self-disclosure of criminal history since the eighteenth birthday or since the last UAA period if terminated favorably within the past 3 years. The NRC concluded that these separate occurrences constitute two examples of the same violation. Therefore, the NRC is assessing these examples as one violation.

Because you are responsible for the actions of your employees, and because the violation, in one case, involved willful aspects, the violation was evaluated under the NRC's Traditional Enforcement process as set forth in the NRC Enforcement Policy. The NRC determined that the violation was similar to Enforcement Policy Violation Example 6.11.c.7, in that it involved a reviewing official unknowingly relying on a deliberate falsification of information to make a UA or UAA determination. Although this type of violation would normally be assessed at Severity Level (SL) III, the NRC considered that in both examples of this violation, the individuals were not licensee officials or supervisors, and therefore, the regulatory significance of the violation does not rise to a SL III. Accordingly, the NRC determined that the violation is appropriately classified as SL IV in accordance with the NRC Enforcement Policy. The current NRC Enforcement Policy can be found on the NRC's website at <http://www.nrc.gov>; by selecting "About NRC," "Regulation," "Enforcement," and finally, "Enforcement Policy."

The NRC considered issuance of a Notice of Violation for this issue. However, after considering the factors set forth in Section 2.3.2 of the NRC Enforcement Policy, the NRC determined that a non-cited violation (NCV) is appropriate in this case because: (1) the violation was identified by your staff; (2) the violation involved the acts of individuals who were not considered to be licensee officials within the context of the NRC Enforcement Policy; (3) the violation appeared to be the isolated actions of employees without management involvement and was not caused by a lack of management oversight; (4) you revoked the individuals' site access; and (5) you placed the issues into the corrective action program.

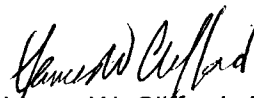
A response to this letter is not required. However, if you contest the NCV or its significance, you should provide a response within 30 days of the date of this letter, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001, with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the

NRC Senior Resident Inspector at MPS.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and your response, if you choose to provide one, will be available electronically for public inspection in the NRC Public Document Room or from the NRC's document management system (ADAMS) accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response, if you choose to provide one, should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction.

Should you have any questions regarding this letter, please feel free to contact Donald Jackson at (610) 337-5306.

Sincerely,



James W. Clifford, Acting Director  
Division of Reactor Projects

cc: Distribution via Listserv

NRC Senior Resident Inspector at MPS.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and your response, if you choose to provide one, will be available electronically for public inspection in the NRC Public Document Room or from the NRC's document management system (ADAMS) accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response, if you choose to provide one, should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction.

Should you have any questions regarding this letter, please feel free to contact Donald Jackson at (610) 337-5306.

Sincerely,

/RA/

James W. Clifford, Acting Director  
Division of Reactor Projects

cc: Distribution via Listserv

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\* see previous concurrence pages for concurrence

\*\* concurrence via email to Anne DeFrancisco dated 01/04/2011

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

January 19, 2011

MEMORANDUM TO: Harold K. Chernoff, Chief  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

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

SUBJECT: FORTHCOMING PUBLIC MEETING WITH DOMINION  
NUCLEAR CONNECTICUT, INC. TO DISCUSS MILLSTONE  
POWER STATION LICENSING ACTIVITIES

DATE & TIME: Tuesday, February 1, 2011  
10:00 a.m. – 12:00 p.m.

LOCATION: U.S. Nuclear Regulatory Commission  
One White Flint North  
11555 Rockville Pike, Room O-8B2  
Rockville, Maryland 20852

PURPOSE: The purpose of the meeting between Dominion Nuclear  
Connecticut, Inc. (DNC or the licensee), and the U.S. Nuclear  
Regulatory Commission (NRC), Office of Nuclear Reactor  
Regulation (NRR) and Region I staff is to discuss NRC  
observations of the Millstone Power Station (MPS) licensing  
activities.

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 NRC after the business portion, but before the meeting is  
adjourned.

MEETING CONTACT: Carleen Sanders, NRR  
301-415-1603  
[carleen.sanders@nrc.gov](mailto:carleen.sanders@nrc.gov)

Handwritten signatures in black ink, including the signature of Carleen J. Sanders.

PARTICIPANTS: Participants from the NRC include members of NRR and Region I.

NRC

Carleen Sanders  
Harold Chernoff  
Donald Jackson  
et al.

Licensee

William Bartron, DNC  
Richard McManus, DNC  
et al.

Interested members of the public can participate in this meeting via a toll-free audio teleconference. Please call the meeting contact before Friday, January 28, 2011, 4:00 p.m. (Eastern Standard Time) to get 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 Nos. 50-336 and 50-423

Enclosure:  
Agenda

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AGENDA

FORTHCOMING PUBLIC TELECONFERENCE WITH

DOMINION NUCLEAR CONNECTICUT, INC.

LICENSING ACTIVITIES

TUESDAY, FEBRUARY 1, 2011

10:00 a.m. – 12:00 p.m.

- Introduction (all)
- NRC observations of the Millstone Power Station licensing activities (NRC)
- DNC observations and comments (DNC)
- Meeting Summary (NRC)
- Public comment

PARTICIPANTS: Participants from the NRC include members of NRR and Region I.

NRC  
Carleen Sanders  
Harold Chernoff  
Donald Jackson  
et al.

Licensee  
William Bartron, DNC  
Richard McManus, DNC  
et al.

Interested members of the public can participate in this meeting via a toll-free audio teleconference. Please call the meeting contact before Friday, January 28, 2011, 4:00 p.m. (Eastern Standard Time) to get the telephone number and the pass code.

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Docket Nos. 50-336 and 50-423

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

REVISED

February 1, 2011

MEMORANDUM TO: Harold K. Chernoff, Chief  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

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

SUBJECT: FORTHCOMING PUBLIC MEETING WITH DOMINION  
NUCLEAR CONNECTICUT, INC. TO DISCUSS MILLSTONE  
POWER STATION LICENSING ACTIVITIES

DATE & TIME: ~~Tuesday, February 1, 2011~~ **Tuesday, February 15, 2011**  
10:00 a.m. – 12:00 p.m.

LOCATION: U.S. Nuclear Regulatory Commission  
One White Flint North  
11555 Rockville Pike, **Room O-8B6**  
Rockville, Maryland 20852

PURPOSE: The purpose of the meeting between Dominion Nuclear  
Connecticut, Inc. (DNC or the licensee), and the U.S. Nuclear  
Regulatory Commission (NRC), Office of Nuclear Reactor  
Regulation (NRR) and Region I staff is to discuss NRC  
observations of the Millstone Power Station (MPS) licensing  
activities.

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 NRC after the business portion, but before the meeting is  
adjourned.

MEETING CONTACT: Carleen Sanders, NRR  
301-415-1603  
[carleen.sanders@nrc.gov](mailto:carleen.sanders@nrc.gov)

---

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

PARTICIPANTS: Participants from the NRC include members of NRR and Region I.

NRC

Carleen Sanders  
Harold Chernoff  
Donald Jackson  
et al.

Licensee

William Bartron, DNC  
Richard McManus, DNC  
et al.

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Docket Nos. 50-336 and 50-423

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AGENDA

FORTHCOMING PUBLIC TELECONFERENCE WITH

DOMINION NUCLEAR CONNECTICUT, INC.

LICENSING ACTIVITIES

TUESDAY, FEBRUARY 15, 2011

10:00 a.m. – 12:00 p.m.

- Introduction (all)
- **DNC observations and comments (DNC)**
- **NRC observations of the Millstone Power Station licensing activities (NRC)**
- Meeting Summary (NRC)
- Public comment

Enclosure

PARTICIPANTS: Participants from the NRC include members of NRR and Region I.

NRC  
Carleen Sanders  
Harold Chernoff  
Donald Jackson  
et al.

Licensee  
William Bartron, DNC  
Richard McManus, DNC  
et al.

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Docket Nos. 50-336 and 50-423

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NAME	CSanders	ABaxter *	HChernoff
DATE	2/1/2011	2/1/2011	2/1/2011

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SAFEGUARDS INFORMATION

February 1, 2011

EA-10-214

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

SUBJECT: FINAL SIGNIFICANCE DETERMINATION FOR A SECURITY-RELATED  
GREEN FINDING [NRC INSPECTION REPORT NOS. 05000336/2011403;  
05000423/2011403] – MILLSTONE NUCLEAR POWER STATION

Dear Mr. Heacock:

This letter provides you with the U.S. Nuclear Regulatory Commission's (NRC's) final significance determination for a finding that was preliminarily determined to be of at least low to moderate security significance (Greater than Green). The finding was identified during an NRC inspection conducted at the Millstone Nuclear Power Station (Millstone) from August 16, 2010 – September 28, 2010, and was presented at an exit meeting held on September 28, 2010. The finding was discussed in detail in the subject inspection report issued on November 9, 2010. Dominion Nuclear Connecticut, Inc. (Dominion) has taken immediate corrective actions to address any security-related vulnerability. The nature of the security-related finding, and the corrective actions taken to address the issue, are considered safeguards information (SGI) and are not included in this letter, but are described in the non-public enclosure.

Our November 9, 2010, letter also offered Dominion the opportunity to attend a Regulatory Conference or reply in writing to provide its position on the facts and assumptions the NRC used to arrive at the finding and its security significance. At Dominion's request, a Regulatory Conference was held on January 6, 2011, at the NRC's Region I office in King of Prussia, Pennsylvania with Leslie Hart, Vice President Nuclear Support Services, and other members of your staff. During the meeting, Dominion staff described Dominion's assessment of the significance of the finding and the corrective actions taken to resolve the issue. Dominion disagreed with the proposed significance of the issue, and presented new information to support Dominion's position.

After further consideration of the information developed during the inspection, and the additional information your staff provided at the conference, the NRC has concluded that the inspection finding is of very low security significance and should be characterized as Green. The NRC has also determined that the finding is associated with a violation of NRC requirements. The NRC is treating the issue as a non-cited violation in accordance with Section 2.3.2.a of the NRC Enforcement Policy because: 1) the violation was of very low security significance; 2) compliance was restored immediately upon identification of the issue; 3) the violation was

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SAFEGUARDS INFORMATION

~~SAFEGUARDS INFORMATION~~

D. Heacock

2

entered into your corrective action program; and, 4) the violation was determined to be neither repetitive nor willful. The basis for the NRC's significance determination and discussion of the violation are provided in the attached Enclosure, which also contains SGI and, therefore, is non-public.

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 located at NRC Headquarters in Rockville, MD, and from the Publicly-Available Records (PARS) component of 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). However, because of the security-related concerns contained in the enclosure, and in accordance with 10 CFR 73.22, a copy of this letter's enclosure will not be available for public inspection. In addition, the NRC is waiving the affidavit requirements for your response, if any. This practice will ensure that your response, if you choose to provide one, will not be made available electronically for public inspection in the NRC Public Document Room or from ADAMS. If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21. Otherwise, mark your entire response, "Security-Related Information – Withhold Under 10 CFR 2.390," and follow the instructions for withholding in 10 CFR 2.391(b)(1).

Sincerely,

*/RA/*

Silas R. Kennedy, Acting Chief  
Plant Support Branch 1  
Division of Reactor Safety

Docket Nos. 50-336; 50-243  
License Nos. DPR-65; NPF-49

Enclosure: As Described (**CONTAINS SAFEGUARDS INFORMATION (SGI)**)

cc w/encl; w/SGI:

J. Curling, Acting Security Department Manager  
F. Murray, President and CEO, NYSERDA, State of New York  
R. Frazier, New York State Office of Homeland Security  
E. Wilds, Jr., PH.D., State Liaison Officer, State of Connecticut

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

~~SAFEGUARDS INFORMATION~~



~~SAFEGUARDS INFORMATION~~

D. Heacock

2

entered into your corrective action program; and, 4) the violation was determined to be neither repetitive nor willful. The basis for the NRC's significance determination and discussion of the violation are provided in the attached Enclosure, which also contains SGI and, therefore, is non-public.

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 located at NRC Headquarters in Rockville, MD, and from the Publicly-Available Records (PARS) component of 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). However, because of the security-related concerns contained in the enclosure, and in accordance with 10 CFR 73.22, a copy of this letter's enclosure will not be available for public inspection. In addition, the NRC is waiving the affidavit requirements for your response, if any. This practice will ensure that your response, if you choose to provide one, will not be made available electronically for public inspection in the NRC Public Document Room or from ADAMS. If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21. Otherwise, mark your entire response, "Security-Related Information – Withhold Under 10 CFR 2.390," and follow the instructions for withholding in 10 CFR 2.391(b)(1).

Sincerely,

*/RA/*

Silas R. Kennedy, Acting Chief  
Plant Support Branch 1  
Division of Reactor Safety

Docket Nos. 50-336; 50-243  
License Nos. DPR-65; NPF-49

Enclosure: As Described (**CONTAINS SAFEGUARDS INFORMATION (SGI)**)

cc w/encl; w/SGI:

J. Curling, Acting Security Department Manager  
F. Murray, President and CEO, NYSERDA, State of New York  
R. Frazier, 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

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OFFICE	RI/DRS								
NAME	S Kennedy/SRK								
DATE	02/01/11								

\* See Previous Concurrence Page

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D. Heacock

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

February 7, 2011

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  
05000336/2010005 AND 05000423/2010005

Dear Mr. Heacock:

On December 31, 2010, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Millstone Power Station Unit 2 and Unit 3. The enclosed inspection report documents the inspection results, which were discussed on January 4, 2011, with Mr. A. J. Jordan 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.

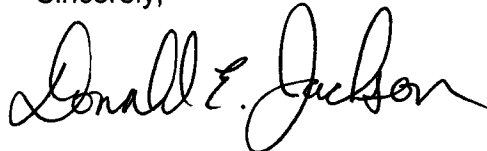
This report documents one NRC-identified finding and one self-revealing finding of very low safety significance (Green). One of these findings was determined to involve a violation of NRC requirements. Additionally, one licensee-identified violation, which was determined to be of very low safety significance, is listed in this report. However, because of the very low safety significance and because they are entered into your corrective action program, the NRC is treating the findings as non-cited violations (NCV) consistent with Section 2.3.2.a of the NRC's 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 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. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

D. Heacock

2

In accordance with Title 10 of the Code of Federal Regulations (CFR) Part 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 Web Site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

A handwritten signature in black ink that reads "Donald E. Jackson". The signature is written in a cursive style with a large, prominent "D" and "J".

Donald E. Jackson, Chief  
Projects Branch 5  
Division of Reactor Projects

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

Enclosure: Inspection Report No. 05000336/2010005 and 05000423/2010005  
w/ Attachment: Supplemental Information

cc w/encl: Distribution via Listserv

D. Heacock

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In accordance with Title 10 of the Code of Federal Regulations (CFR) Part 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 Web Site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Donald E. Jackson, Chief  
Projects Branch 5  
Division of Reactor Projects

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

Enclosure: Inspection Report No. 05000336/2010005 and 05000423/2010005  
w/ Attachment: Supplemental Information

Distribution w/encl:

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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.: 05000336/2010005 and 05000423/2010005

Licensee: Dominion Nuclear Connecticut, Inc.

Facility: Millstone Power Station, Units 2 and 3

Location: P. O. Box 128  
Waterford, CT 06385

Dates: October 1, 2010 through December 31, 2010

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Enclosure

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## SUMMARY OF FINDINGS

IR 05000336/2010005, 05000423/2010005; 10/1/2010 – 12/31/2010; Millstone Power Station Unit 2 and Unit 3; Event Follow-up, Other Activities.

The report covered a three-month period of inspection by resident and region-based inspectors. Two Green findings, one of which was a non-cited violation (NCV), were identified. Additionally, one licensee-identified NCV 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." The cross-cutting aspect was determined using IMC 0310, "Components Within the Cross Cutting Areas." Findings for which the significance determination process (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: Initiating Events

- Green. A self-revealing finding (FIN) of very low significance was identified for Dominion's failure to provide an adequate procedure for backwashing the Unit 2 condenser water boxes in accordance with procedure MP-05-MMM, "Manuals, Procedures, Guidelines, Handbooks and Forms." Specifically, in implementing the procedure, the 'A' circulating water (CW) pump automatically ramped down to zero speed shortly after securing the 'B' CW pump. This resulted in a loss of condenser vacuum, which caused an automatic turbine trip. The turbine trip caused an automatic reactor trip. Dominion entered the issue into their corrective action program (CAP) and revised the operating procedure (OP) 2325D.

The finding is more than minor because it was similar to NRC Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," Example 4b, in that an inadequate procedure led to a reactor trip. The finding was associated with the Procedure Quality attribute of the Initiating Events cornerstone, and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Specifically, Dominion's failure to provide an adequate procedure for backwashing Unit 2 condenser water boxes resulted in the variable frequency drive (VFD) logic securing the only CW pump running in that condenser, and subsequently caused a reactor trip. The finding was of very low safety significance (Green) because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. The inspectors determined that this finding had a cross-cutting aspect in the Human Performance cross-cutting area, Resources component, because Dominion did not provide an accurate and up-to-date procedure for the backwashing of the Unit 2 water boxes. [H.2(c)] (Section 4OA3)

### Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green, NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," in that, Dominion did not take adequate corrective action

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following the identification of a degraded condition. Specifically, maintenance personnel identified a broken jacket water fitting (banjo bolt) on the Unit 3, 'B' emergency diesel generator (EDG), but a condition report (CR) was not initiated. Subsequently, an additional similarly degraded fitting resulted in extended unavailability on the Unit 3, 'B' EDG. In response, Dominion entered the issue into the CAP and replaced the broken jacket water fitting.

The finding is 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. The inspectors determined the finding was of very low safety significance (Green) because it was not a design or qualification deficiency, did not represent an actual loss of system safety function of a single train for greater than its Technical Specification (TS) allowed outage time, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding had a cross-cutting aspect in the Problem Identification and Resolution cross-cutting area, Corrective Action Program component, because Dominion did not ensure that issues potentially impacting nuclear safety were promptly identified, fully evaluated, and that actions were taken to address safety issues in a timely manner, commensurate with their safety significance. Specifically, Dominion did not initiate a CR in September 2009 for a degraded condition on the safety-related Unit 3, 'B' EDG. [P.1(a)] (Section 4OA5)

### **Other Findings**

A violation of very low safety significance, which was identified by the licensee, has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. The violation and corrective action tracking numbers are listed in Section 4OA7 of this report.

## REPORT DETAILS

### Summary of Plant Status

Millstone Unit 3 operated near or at 100 percent power during the inspection period. Millstone Unit 2 began the inspection period operating at 100 percent power. On November 19, 2010, Unit 2 entered a forced shutdown to repair a leaking feedwater vent line to the #2 Steam Generator (SG). Unit 2 returned to 100 percent power on November 22, 2010. On November 28, 2010, Unit 2 tripped due to a loss of condenser vacuum while preparing to backwash the 'B' CW water box. Unit 2 returned to 100 percent power on December 1, 2010. On December 11, 2010, Unit 2 had an unplanned power reduction to 54 percent to repair a tube leak in the 4 'A' feedwater heater, returned to full power on December 15, 2010, and 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)

##### Seasonal Site Inspection

##### a. Inspection Scope

The inspectors reviewed Unit 2 and Unit 3's readiness for seasonal cold weather. The inspectors reviewed selected equipment, instrumentation, and supporting structures to determine if they were configured in accordance with Dominion's procedures, and that adequate controls were in place to ensure functionality of the systems. The inspectors reviewed the Unit 2 and Unit 3 Updated Final Safety Analysis Report (UFSAR) and TSs, and compared the analysis with procedure requirements to ascertain that procedures were consistent with the UFSAR. The inspectors performed partial walkdowns of the Unit 2 EDG, auxiliary steam, and reactor building closed cooling water systems; and condensate surge, condensate storage, refueling water storage, and primary water storage tanks. Partial walkdowns were performed of the Unit 3 intake structure, condensate storage and surge tanks, and heat tracing of safety-related piping to determine if actions required by the cold weather procedure were complete. Documents reviewed during the inspection are listed in the Attachment.

##### b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04 - 2 samples)Partial System Walkdowns• Inspection Scope

The inspectors performed two partial system walkdowns during this inspection period. The inspectors performed a walkdown of each system to determine if the critical portions of the selected systems were correctly aligned in accordance with the procedures, and to identify any discrepancies that may have had an effect on operability. The walkdowns included selected switch and valve position checks, and verification of electrical power to critical components. Finally, the inspectors evaluated other elements, such as material condition, housekeeping, and component labeling. Documents reviewed during the inspection are listed in the Attachment. The following systems were reviewed based on their risk significance for the given plant configuration:

Unit 2

- 'A' and 'B' Motor Driven Auxiliary Feedwater (AFW) Pumps when the Turbine Driven AFW Pump Was Out of Service (OOS) for Testing on November 17, 2010; and

Unit 3

- 'A' EDG when the 'B' EDG was OOS for an extended outage on November 15, 2010.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05Q – 6 samples)a. Inspection Scope

The inspectors performed walkdowns of six fire protection areas. The inspectors reviewed Dominion's fire protection program to determine the required fire protection design features, fire area boundaries, and combustible loading requirements for the selected areas. The inspectors walked down these areas to assess Dominion's control of transient combustible material and ignition sources. In addition, the inspectors evaluated the material condition and operational status of fire detection and suppression capabilities, fire barriers, and any related compensatory measures. The inspectors compared the existing conditions of the areas to the fire protection program requirements to determine if all program requirements were being met. Documents reviewed during the inspection are listed in the Attachment. The fire protection areas reviewed included:

Unit 2

- 'A' EDG Fire Area H-7A, Zone A-15;

Unit 3

- 'B' EDG Fire Area EG-4, Zone A;
- East Switchgear Area Fire Area CB-3, Zone N/A;
- Control Building Fire Area CB-1 to 14;
- Station Blackout (SBO) Diesel Generator Enclosure, Fire Area SBO-1; and
- Main Steam Valve Enclosure Building Fire Area MSV-1.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)a. Inspection Scope

The inspectors reviewed the flood protection measures for equipment in the Unit 3 Reactor Plant Component Cooling Water (RPCCW) area. The inspectors evaluated Dominion's protection of safety-related systems from internal flooding conditions. The inspectors performed a walkdown of the area, interviewed the Probabilistic Risk Analyst (PRA) engineer, and reviewed the internal flooding evaluation. Documents reviewed during the inspection are listed in the Attachment.

- Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11 – 3 samples).1 Licensed Operator Requalification (71111.11B – 1 sample)a. Inspection Scope

A review was conducted of recent operating history documentation found in inspection reports, licensee event reports, the licensee's corrective action program, and the most recent NRC plant issues matrix (PIM). The inspectors also reviewed specific events from the licensee's CAP which indicated possible training deficiencies, to verify that they had been appropriately addressed. The senior resident inspector was also consulted for insights regarding licensed operator performance. These reviews did not detect any operational events that were indicative of possible training deficiencies.

For the 2010 examination cycle, the biennial written examinations and annual operating tests administered for weeks three, four, and five were reviewed for content, quality, and excessive overlap to ensure that these exams met the criteria established in the Examination Standards and 10 CFR 55.59.

On January 3, 2011, the results of the 2010 biennial written and annual operating tests for both Unit 2 and Unit 3 were reviewed to determine if pass/fail rates were consistent with the guidance of NUREG-1021, Revision 9, Supplement 1, "Operator Licensing Examination Standards for Power Reactors," and NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process (SDP)." The review verified the following:

#### Unit 2

- Crew pass rates were greater than 80 percent (Pass rate was 100 percent);
- Individual pass rates on the dynamic simulator test were greater than 80 percent (Pass rate was 100 percent);
- Individual pass rates on the job performance measures of the operating examination were greater than 80 percent (Pass rate was 98.0 percent);
- Individual pass rates on the written examination (2010) were greater than 80 percent (Pass rate was 100 percent);
- More than 75 percent of the individuals passed all portions of the 2010 operating examination (Pass rate was 98.0 percent);

#### Unit 3

- Crew pass rates were greater than 80 percent (Pass rate was 100 percent);
- Individual pass rates on the dynamic simulator test were greater than 80 percent (Pass rate was 100 percent);
- Individual pass rates on the job performance measures of the operating examination were greater than 80 percent (Pass rate was 100 percent);
- Individual pass rates on the written examination (2010) were greater than 80 percent (Pass rate was 98.0 percent); and
- More than 75 percent of the individuals passed all portions of the 2010 operating examination (Pass rate was 98.0 percent).

Observations were made of the Unit 2 dynamic simulator examinations and job performance measures (JPMs) administered during the week of November 1, 2010, for Operations Crew 'D'. These observations included facility evaluations of crew and individual performance during the dynamic simulator examinations and individual performance of JPMs.

The remediation plans for two biennial written exams, one 2009 annual dynamic crew exam failure, several as-found dynamic exam evaluations, and a number of individual cyclic written test failures for Unit 2 were reviewed to assess the effectiveness of the

remedial training. Two Unit 2 license reactivations were reviewed to ensure that 10 CFR 55.53 license conditions and applicable program requirements were met.

Instructors and training/operations management were interviewed for feedback on their training program. Simulator performance and fidelity were reviewed for conformance to the reference plant control room. Selected simulator deficiency reports were reviewed to assess licensee prioritization and timeliness of resolution. Simulator testing records were reviewed to verify that scheduled tests were performed. Samples of nine operator medical examinations were reviewed for compliance with license conditions, including NRC regulations.

b. Findings

No findings were identified.

.2 Resident Inspector Quarterly Review (71111.11Q – 2 samples)

a. Inspection Scope

The inspectors observed simulator-based licensed operator requalification training for Unit 2 on October 13, 2010, and for Unit 3 on November 2, 2010. The inspectors evaluated crew performance in the areas of clarity and formality of communications; ability to take timely actions; prioritization, interpretation, and verification of alarms; procedure use; control board manipulations; oversight and direction from supervisors; and command and control. Crew performance in these areas was compared to Dominion management expectations and guidelines as presented in OP-MP-100-1000, "Millstone Operations Guidance and Reference Document." The inspectors compared simulator configurations with actual control board configurations. The inspectors also observed Dominion evaluators discuss identified weaknesses with the crew and/or individual crew members, as appropriate. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 2 samples)

a. Inspection Scope

The inspectors reviewed two samples of Dominion's evaluation of degraded conditions, involving safety-related structures, systems and/or components for maintenance effectiveness during this inspection period. The inspectors reviewed Dominion's implementation of the "Maintenance Rule," 10 CFR 50.65. The inspectors reviewed Dominion's ability to identify and address common cause failures, the applicable Maintenance Rule scoping document for each system, the current classification of these systems in accordance with 10 CFR 50.65 (a)(1) or (a)(2), and the adequacy of the

performance criteria and goals established for each system, as appropriate. The inspectors also reviewed recent system health reports, CRs, apparent cause determinations, functional failure determinations, operating logs, and discussed system performance with the responsible system engineer. Documents reviewed during the inspection are listed in the Attachment.

The specific systems/components reviewed were:

Unit 3

- SBO Diesel Generator; and
- Turbine Driven AFW Pump.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors evaluated online risk management for five emergent and planned activities. The inspectors reviewed maintenance risk evaluations, work schedules, and control room logs to determine if maintenance or surveillance activities adversely affected the plant risk already incurred with out-of-service (OOS) components. The inspectors evaluated whether Dominion took the necessary steps to control work activities, minimize the probability of initiating events, and maintain the functional capability of mitigating systems. The inspectors assessed Dominion's risk management actions during plant walkdowns. Documents reviewed during the inspection are listed in the Attachment. The inspectors reviewed the conduct and adequacy of risk assessments for the following maintenance and testing activities:

Unit 2

- High Work Risk associated with the installation of UAC3 Bypass Power and Testing of the VR-11 Static Switch the week of October 4, 2010;
- Dominion planning and control of emergent work during troubleshooting activities on VR-11 from October 25, 2010, through October 29, 2010;
- Yellow Risk associated with the 'A' High Pressure Safety Injection (HPSI) pump and HPSI valve stroke time surveillances on November 4, 2010;
- Risk assessment of emergent work to backwash 'C' CW pump which temporarily rendered 'B' and 'C' SW pumps inoperable with 'A' EDG inoperable on December 23, 2010; and

Unit 3

- December 6, 2010, potential Orange risk due to High Trip risk and the 'B' AFW pump being OOS, however, Dominion recognized the scheduling issue and postponed work in the 'F' intake bay until the 'B' AFW pump was returned to service eliminating the High Trip risk component.

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15 – 6 samples)a. Inspection Scope

The inspectors reviewed six operability determinations (OD). The inspectors evaluated the ODs against the guidance contained in NRC Regulatory Issue Summary 2005-20, Revision to Guidance Formerly Contained in NRC Generic Letter 91-18, "Information to Licensees Regarding Two NRC Inspection Manual Sections on Resolution of Degraded and Nonconforming Conditions and on Operability." The inspectors also discussed the conditions with operators and engineers, as necessary. Documents reviewed during the inspection are listed in the Attachment. The inspectors reviewed the adequacy of the following evaluations of degraded or non-conforming conditions:

Unit 2

- CR397817, 'A' EDG Damaged Fuse Holder for the Automatic and Manual Voltage Regulators;
- ODM, 2-FW-261B, #2 SG Feedwater Header Vent Leak Inside Containment;

Unit 3

- ODM 000170, Operation of 3CHS\*V368 Failed Open;
- CR401027, 3SWP\*AOV39A Valve Body, Disc and Seat Retainer Ring Erosion;
- CR403794, 3EGF\*TRS1A Fuel Oil Transfer Pump Breaker Failed Over Current Trip Test; and
- CR398186, Non-QA part installed in 'C' CHS pump.

b. Findings

No findings were identified.



1R18 Plant Modifications (71111.18 – 1 sample)a. Inspection Scope

To assess the adequacy of the temporary leak repair (encapsulation) of 2-FW-261B, #2 SG feedwater vent valve temporary modification, the inspectors performed walkdowns of the work site, interviewed plant staff, and reviewed applicable documents, including procedures, calculations, modification packages, engineering evaluations, drawings, corrective action program documents, the UFSAR, and TS.

For the modification reviewed, the inspectors determined whether selected attributes (component safety classification and seismic qualification), were consistent with the design and licensing bases. Design assumptions were reviewed to verify that they were technically appropriate and consistent with the UFSAR. For this temporary modification, the equivalency evaluation was reviewed. The inspectors also verified that procedures and calculations were properly updated with revised design information. In addition, the inspectors verified that the as-built configuration was accurately reflected in the design documentation, and that post-modification testing was adequate to ensure the structures, systems, and components would function properly. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 2 samples)a. Inspection Scope

The inspectors reviewed post-maintenance test (PMT) activities to determine whether the PMT adequately demonstrated that the safety-related function of the equipment was satisfied, given the scope of the work specified, and that operability of the system was restored. In addition, the inspectors evaluated the applicable test acceptance criteria to evaluate consistency with the associated design and licensing bases, as well as TS requirements. The inspectors also evaluated whether conditions adverse to quality were entered into the CAP for resolution. Documents reviewed during the inspection are listed in the Attachment. The following maintenance activities and PMTs were evaluated:

Unit 2

- OP 2346A, 'A' EDG, "Revision 027-11 following Troubleshooting and Corrective Maintenance on the 'A' EDG on October 5, 2010;" and

Unit 3

- OP 3346A, 'B' EDG, "Revision 024-04 Following EDG Overhaul and Corrective Maintenance on November 16, 2010."

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 – 1 sample)a. Inspection Scope

On November 19, 2010, Unit 2 conducted a plant shutdown and entered a forced outage to temporary leak repair (encapsulate) 2-FW-261B, #2 SG feedwater vent valve, which had a body to bonnet leak. The inspectors evaluated the outage plan and outage activities to confirm that Dominion had appropriately considered risk, had developed risk reduction and plant configuration control methods, had adhered to license and TS requirements, and had taken appropriate corrective action prior to start-up. The inspectors observed the shutdown, portions of the cooldown, the reactor start-up, and portions of the power ascension activities. The inspectors verified that conditions adverse to quality identified during the outage were entered into the CAP. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 3 samples)a. Inspection Scope

The inspectors reviewed surveillance activities to determine whether the testing adequately demonstrated equipment operational readiness and the ability to perform the intended safety-related function. The inspectors attended pre-job briefings, reviewed selected prerequisites and precautions to determine if they were met, and observed the tests to determine whether they were performed in accordance with the procedural steps. Additionally, the inspectors reviewed the applicable test acceptance criteria to evaluate consistency with associated design bases, licensing bases, and TS requirements; and that the applicable acceptance criteria were satisfied. The inspectors also evaluated whether conditions adverse to quality were entered into the CAP for resolution. Documents reviewed during the inspection are listed in the Attachment. The following surveillance activities were evaluated:

Unit 2

- EN 21054, "Spent Fuel Rack Boraflex Monitoring," Revision 002-05;
- SP 2620A-001, "CEA Partial Movement," Revision 009-00; and

Unit 3

- SP 3601F.5, "Reactor Coolant Valve Operability, Section 8 PORV Block Valve Stroke Testing," Revision 010-01.

b. Findings

No findings were identified.

**2. RADIATION SAFETY****Cornerstone: Public and Occupational Radiation Safety****2RS01 Radiological Hazard Assessment and Exposure Controls (71124.01 – 1 sample)**a. Inspection Scope

During the period November 15, 2010 through November 18, 2010, the inspectors conducted the following activities to verify that Dominion was evaluating, monitoring, and controlling radiological hazards for work performed in locked high radiation areas (LHRA), other radiological controlled areas, and that workers were adhering to these controls when working in these areas. Implementation of these controls was reviewed against the criteria contained in 10 CFR 20, TSs, and with Dominion procedures.

Radiological Hazards Assessment

The inspectors reviewed recently implemented corporate procedures that replaced site procedures regarding various radiation protection processes, including radiological postings, access controls for high and very high radiation areas, dose mitigation measures, and personnel contamination monitoring. The inspectors determined that the new procedures did not reduce the scope or effectiveness of previously established radiological controls.

Radiological Hazards Control and Work Coverage

The inspectors toured accessible radiological controlled areas in Unit 2 and Unit 3, including the fuel handling buildings and auxiliary buildings, to confirm the accuracy of survey data and the adequacy of postings and radiation work permits (RWP). The inspectors reviewed survey maps for areas toured to determine the timeliness of survey data and the adequacy of RWP controls.

### Contamination and Radioactive Material Control

The inspectors observed workers surveying and releasing potentially contaminated materials for unrestricted use. The inspectors verified that the counting instrumentation was located in a low background area and that the instruments sensitivity was appropriate for the type of contamination being measured.

### Problem Identification and Resolution

Relevant CRs, associated with radiological controls, and electronic dosimeter dose/dose rate alarm reports initiated from September 2010 through November 2010, were reviewed and discussed with Dominion staff to determine if the follow-up activities were being performed in an effective and timely manner, commensurate with their safety significance.

#### b. Findings

No findings were identified.

### 2RS05 Radiation Monitoring Instrumentation (71124.05 – 1 sample)

#### a. Inspection Scope

During the period November 15, 2010 through November 18, 2010, the inspectors performed the following activities to evaluate the operability and accuracy of radiation monitoring instrumentation used to ensure a safe work environment, and to detect and quantify radioactive process streams and effluent releases. Implementation of these programs was reviewed against the criteria contained in 10 CFR 20, applicable industry standards, and with Dominion procedures.

### Walkdown of Process and Effluent Monitoring Systems

The inspectors, with the assistance of cognizant Plant Systems Engineers and the I&C Supervisor, walked down selected portions of the liquid and gaseous monitoring systems installed in Unit 2 and Unit 3 to assess material condition and the status of system upgrades.

In Unit 2, the walkdown included portions of the following monitors:

- Fuel Handling Building, RM-8145;
- Radwaste Building, RM-8999;
- Containment Air Monitors, RM-8262 A/B;
- Waste Gas Tank Monitor, RM-9095;
- Clean Liquid Waste Effluent Monitor, RM-9049;
- Aerated Liquid Waste Effluent Monitor, RM-9116;

- Ventilation Vent Monitor, RM-8132 A/B; and
- Control Room Area Monitor, RM-7899.

In Unit 3, the walkdown included portions of the following monitors:

- Ventilation Vent Monitor, RE-10A/B;
- SCLRS Monitor, RE 19A/B;
- Engineered Safeguards Building Monitor, RE-49;
- Containment Air Monitor, CMS-22;
- Control Room Ventilation Monitor, RE-16A/B;
- Condenser Air Ejector, RE-21;
- Process Gas Monitor, RE-48;
- Turbine Building Sump Monitor, RE-50;
- Liquid Waste Effluent Monitor, RE-70; and
- Waste Neutralization Sump Monitor, RE-07.

#### Calibration of Portable Survey Instruments, Area Monitors, Electronic Dosimeters and Air Samplers

The inspectors reviewed the operating procedures, calibration reports, and current source activities/dose rate characterizations for the Shepherd Model 89 calibrators (Nos. 9068 and 9155) used for calibrating survey instruments and electronic dosimeters.

The inspectors reviewed the calibration records for selected survey meters, electronic dosimeters, and contamination monitors including small article monitors (SAM) (SAM 9, SAM-11, SAM-12), personal contamination monitors (ARGOS 4A/B & PM-7), portable instruments (RO-2), electronic dosimeters (Siemens), and laboratory counting instruments (SAC-4, BC-4).

The inspectors observed technicians performing an electronic/source calibration of an area monitoring instrument (AMP-100), and daily operational checks of various instruments including contamination monitors (SAM-9, SAM-11, & SAM-12), various hand held survey instruments (RO-2), and personnel contamination monitors (ARGOS - 4 A/B, PM-7). The inspectors reviewed daily quality control data for counting room instruments (SAC-4, BC-4). The inspectors confirmed that procedural requirements were met and that the instruments had the required accuracy.

During walkdowns in various plant areas, the inspectors confirmed that available monitoring instruments were calibrated, that daily source checks had been performed, and that the instruments were operational. Instruments checked included handheld survey instruments, electronic dosimeters, air monitors, and contamination monitors.

The inspectors reviewed contamination sampling results (10 CFR 61 radionuclide analyses) used to characterize difficult-to-measure radioisotopes, to determine if the calibration sources were representative of the radioisotopes found in the plant's source term. Whole-body counting system records and contamination monitor setpoints were

reviewed to determine if this data was incorporated in the system setup to ensure that difficult-to-measure radioisotopes were accounted for when making measurements.

#### Laboratory Instrumentation

The inspectors reviewed the calibration records, daily source checks, and maintenance records for selected gamma spectroscopy systems (Unit 2 Detectors Nos 1, 2, 3, 4, 7, and 8; and Unit 3 detectors Nos. 11, 12, 13, 15, and 16) and scintillation counters (Packard TriCarb Nos. 422931 & 422932) to verify that the instruments were calibrated and properly maintained. The inspectors confirmed that the check sources used aligned with the plant's isotopic mix.

#### Whole Body Counters

The inspectors reviewed the calibration, daily quality control data, and operating procedure for the FastScan whole body counting system. The inspectors determined that appropriate radioactive source phantoms were used in performing calibrations, and that calibration sources were representative of radioisotopes found in the plant's source term.

#### Plant Process and Post-Accident Monitoring Instrumentation

The inspectors reviewed the calibration records for liquid and gaseous effluent instruments installed in Unit 2 and Unit 3. Records reviewed included the high range containment radiation monitors, waste liquid discharge monitors, plant vent wide range monitors, incore seal table area monitors, and control room rad monitors. The inspectors determined that the electronic and radiation source calibrations were appropriately conducted, and that the alert and high alarm setpoints were properly established.

#### Problem Identification and Resolution

The inspectors reviewed selected CRs, system health reports, and various Nuclear Quality Assurance reports to evaluate Dominion's threshold for identifying, evaluating, and resolving problems for the radiation monitoring instrumentation. Included in this review were CRs related to radiation worker and radiation protection technician errors to determine if an observable pattern traceable in the maintenance or use of radiation instruments was evident.

b. Findings

No findings were identified.

#### 4. OTHER ACTIVITIES [OA]

##### 4OA1 Performance Indicator (PI) Verification (71151)

##### .1 Cornerstone: Mitigating Systems (2 samples)

##### a. Inspection Scope

The inspectors reviewed Dominion submittals for the PIs listed below to verify the accuracy of the data reported during that period. The PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," were used to verify the basis for reporting each data element. The inspectors reviewed portions of the operations logs, monthly operating reports, and LERs; and discussed the methods for compiling and reporting the PIs with cognizant licensing and engineering personnel. Documents reviewed during the inspection are listed in the Attachment.

##### Unit 2

- Safety System Functional Failures [MS05]; and

##### Unit 3

- Safety System Functional Failures [MS05].

##### 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 Program. Specifically, the inspectors reviewed dosimetry alarm reports, CRs, 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 2009 through October 2010. 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.

.3 RETS/ODCM Radiological Effluent Occurrences (1 sample)

a. Inspection Scope

The inspectors reviewed Unit 2 and Unit 3 effluent release reports for the period October 2009 through October 2010, for issues related to the public radiation safety performance indicator as specified in NEI 99-02 "Regulatory Assessment Performance Indicator Guideline." The NEI criteria for reporting performance indicator data includes radiological effluent release occurrences that exceed 1.5 millirem (mrem)/quarter whole body or 5.0 mrem/quarter organ dose for liquid effluents; 5 millirads (mrads)/quarter gamma air dose; 10 mrad/quarter beta air dose; and 7.5 mrads/quarter for organ dose for gaseous effluents. This inspection activity represents the completion of one sample relative to this inspection area; completing the annual inspection requirements. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Review of Items Entered into the Corrective Action Program

a. Inspection Scope

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into Dominion's CAP. This was accomplished by reviewing the description of each new CR and attending daily management review committee meetings. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings were identified.

.2 Semi-Annual Problem Identification & Resolution (PI&R) Trend Review (1 sample)

a. Inspection Scope

As required by Inspection Procedure 71152, the inspectors performed a review of the Dominion corrective action program, PIs, and associated documents to identify trends that may indicate existence of safety significant issues. The inspectors review was focused on repetitive equipment and corrective maintenance issues, but also considered the results of daily inspector corrective action program item screening.



b. Assessments and Observations

No findings were identified.

Dominion's root cause evaluation (RCE001025) on late and deferred preventive maintenance items (PMs) determined that Millstone is not meeting industry standards for deferred PMs and PMs that are past due. Dominion frequently performs PMs late in the grace period and has PMs that have exceeded their 25 percent grace period. The RCE has assigned corrective actions to improve performance in these areas. Work control has identified focus areas to improve their performance. There are plans to develop cycle plans for the major equipment and then align equipment PMs to match the cycle plan. Additionally, there are plans to make the work order routing process more efficient by enhancing Maximo to allow parallel routing of work orders. The inspectors also identified that temporary modifications that require an outage to correct are not being tracked, and as a result, there are temporary modifications that have been in service for several years without a permanent resolution.

4OA3 Event Follow-up (71153 – 3 samples)

.1 Unit 2 Reactor Trip Due to Loss of All Circulating Water to a Waterbox

a. Inspection Scope

On November 28, 2010, at 3:15 p.m., Unit 2 experienced a loss of all circulating water (CW) supply to the 'A' condenser due to an automatic ramp down of the 'A' CW pump shortly after the 'B' CW pump was secured for 'B' water box backwashing. The loss of both CW pumps caused a decrease in condenser vacuum which resulted in a turbine trip. The turbine trip caused an automatic reactor trip. All safety systems functioned as expected.

The inspectors responded to the control room and evaluated the adequacy of operator actions in accordance with approved procedures and TS requirements. The inspectors performed walkdowns of the control room and interviewed personnel to verify that the plant was stable. The inspectors also reviewed the sequence of events information in order to determine if there were any other plant or equipment anomalies.

The inspectors observed the reactor start up and portions of the power ascension. The inspectors reviewed CRs to ensure conditions adverse to quality were entered into Dominion's CAP for resolution.

b. Findings

Introduction: A self-revealing finding (FIN) of very low safety significance (Green) was identified for Dominion's failure to provide an adequate procedure for backwashing of the Unit 2 condenser water boxes in accordance with procedure MP-05-MMM, "Manuals, Procedures, Guidelines, Handbooks, and Forms." Specifically, in implementing the procedure, the 'A' CW automatically ramped down to zero speed by variable frequency

drive (VFD) logic shortly after securing the 'B' CW pump. This resulted in a loss of condenser vacuum, which resulted in a turbine trip. The turbine trip caused an automatic reactor trip.

Description: On November 28, 2010, Unit 2 operations personnel were preparing to backwash the 'B' condenser water box. The operator pushed the 'B' CW pump stop pushbutton, and then closed the 'A' and 'B' water box outlet valves as directed by procedure OP 2325D, "Backwashing Operations," which caused the 'A' CW to ramp down to zero speed. The loss of both CW pumps in the 'A' condenser resulted in a loss of condenser vacuum, which caused an automatic turbine trip. The turbine trip caused an automatic reactor trip.

A review of the events determined that while performing procedure OP 2325D prior to the VFD modification, the operator stopped the CW pump by taking the hand switch to stop, which opened the pump breaker. The procedure was modified in October 2009 as a result of the CW pump VFD modification to instruct the operator to stop the CW pump by pushing the CW pump stop button. In the VFD mode, this caused the pump to slowly ramp down to zero speed. The revision to OP 2325D did not include a caution about the VFD ramp down time when securing a CW pump. Instead, after pressing the CW pump stop button, the procedure stated to close both water boxes' outlet valves without delay to maximize backwash time. By shutting the water box outlet valves while the 'B' CW pump speed was ramping down, the 'A' CW system logic saw no discharge path for the pump (i.e. 'B' CW pump running and both water box discharge valves shut) and automatically ramped down the 'A' CW pump.

Analysis: The inspectors determined that Dominion's failure to provide an adequate procedure for backwashing the Unit 2 water boxes in accordance with procedure MP-05-MMM, "Manuals, Procedures, Guidelines, Handbooks, and Forms," was a performance deficiency. 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, impacts on the NRC's ability to perform its regulatory function, or willful aspects to the finding. The finding is more than minor because it was similar to NRC Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," Example 4b, in that an inadequate procedure led to a reactor trip. The finding was associated with the Procedure Quality attribute of the Initiating Events cornerstone and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Specifically, Dominion's failure to provide an adequate procedure for backwashing the Unit 2 condenser water boxes resulted in the VFD logic securing the only CW pump running in that condenser and, subsequently, caused a reactor trip. The inspectors conducted a Phase 1 screening in accordance with NRC Inspection Manual Chapter (IMC) Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," and determined that the finding was of very low safety significance (Green) because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available.

The inspectors determined that this finding had a cross-cutting aspect in the Human Performance cross-cutting area, Resources component, because Dominion did not provide an accurate and up-to-date procedure for the backwashing of the Unit 2 water boxes. [H.2(c)]

Enforcement: This finding does not involve enforcement action because no regulatory requirement violation was identified. Dominion entered this issue into their CAP (CR405377) and has revised procedure OP 2325D. Because this finding does not involve a violation of regulatory requirements and has very low safety significance, it is identified as a finding. (FIN 05000336/2010005-01, Failure to Provide an Adequate Procedure for Backwashing Condenser Water Boxes Results in Reactor Trip).

.2 (Closed) LER 05000423/2010-002 Millstone Unit 3 Automatic Reactor Trip on Low-Low 'C' Steam Generator Water Level

a. Inspection Scope

On May 17, 2010, an automatic reactor trip occurred on Millstone Unit 3 while the unit was in Mode 1 at 17 percent power during a reactor start up following a refueling outage. The reactor trip occurred when level on the 'C' SG exceeded the low level trip set point. The operators had taken manual control of all four feed regulating bypass valves (FRBV) after the automatic feedwater control system had been unable to control SG levels. When the operator attempted to slowly throttle the feed rate to the 'C' SG, the 'C' FRBV spuriously closed. The operator was unable to restore SG level and establish stable control before the reactor trip occurred.

The inspectors responded to the control room and evaluated the adequacy of operator actions in accordance with approved procedures and TS requirements. The inspectors performed walkdowns of the control room and interviewed personnel to verify that the plant was stable. The inspectors also reviewed the sequence of events information in order to determine if there were any other plant or equipment anomalies. The inspectors reviewed the root cause evaluation prepared by Dominion.

The inspectors observed the reactor start up and portions of the power ascension. The inspectors reviewed the condition reports and associated root cause report to ensure conditions adverse to quality were entered for resolution in the corrective action system. This issue was previously documented in NRC Inspection Report 05000423/2010003 as a Green finding. The LER was reviewed and no additional findings were identified. This LER is closed.

.3 (Closed) LER 05000423/2010-004 Millstone Unit 3 Inoperable Turbine Driven Auxiliary Feedwater Pump due to Degraded Relief Valve

a. Inspection Scope

On August 21, 2010, while operating in Mode 1 at 100 percent power, the turbine driven auxiliary feedwater (TDAFW) pump was declared inoperable during surveillance test "SP 3622.3," when suction relief valve 3FWA\*RV45 began leaking by its seat. Further investigation revealed that this condition had first existed on June 30, 2010, but had not been identified during that surveillance test resulting in an extended period of inoperability of the TDAFW pump in excess of the allowable outage time in TS 3.7.1.2. Dominion determined the TDAFW pump was available to perform its safety function for the entire period of time.

The inspectors evaluated the adequacy of Dominion's response in accordance with approved procedures and TS requirements. The inspectors observed the repair and retest of 3FWA\*RV45 and the restoration of the TDAFW pump to an operable status. The inspectors also reviewed the root cause evaluation prepared by Dominion. The enforcement aspects of this finding are discussed in Section 4OA7. The inspectors reviewed the condition reports and the LER. This LER is closed.

4OA5 Other Activities

.1 Follow up Inspection for Three or More Severity Level IV Traditional Enforcement Violations in the Same Area in a 12-Month Period (92723)

a. Inspection Scope

The inspectors performed a follow-up inspection for three Severity Level (SL) IV Traditional Enforcement violations in the area of willfulness that were investigated by the NRC in 2009. The violations involved three separate incidents at Millstone Power Station in which contract personnel for which Dominion had responsibility deliberately falsified information. The results of the NRC's investigations of these matters were documented in two letters to Dominion dated September 10, 2009, and December 14, 2009.

The objectives of the inspection were to determine whether Dominion:

- Provided assurance that the cause(s) of the SL IV Traditional Enforcement violations were understood;
- Provided assurance that the extent of condition and extent of cause of the SL IV Traditional Enforcement violations were identified; and
- Provided assurance that corrective actions for Traditional Enforcement violations were sufficient to address the cause(s).

The inspectors reviewed Dominion's collective significance evaluation for the violations and examined other CAP documents and supporting information. The inspectors also interviewed management and staff personnel who were familiar with the violations or participated in the evaluation and corrective actions. Documents reviewed during the inspection are listed in the Attachment.

b. Findings and Observations

The inspectors concluded that Dominion completed an adequate common cause evaluation that used a systematic method to identify the causes of the Traditional Enforcement violations. Dominion considered the primary common cause to be misjudgment, due in part to personnel not being fully aware of the significance of their actions.

The inspectors determined the station adequately assessed the extent of condition and extent of cause of the violations. Dominion's evaluation also considered other areas where similar conditions or causal factors may have existed.

The inspectors concluded that Dominion's corrective actions were sufficient to address the common cause of misjudgment. The inspectors noted that the primary focus of the corrective actions was to create additional awareness of the significance and consequence of willful misconduct. The planned corrective actions addressed the causes described in the evaluation. However, the inspectors identified two observations related to the implementation of the corrective actions.

First, the station did not properly implement a corrective action intended to raise awareness of willful misconduct for station personnel. The corrective action stated in the collective significance evaluation was to publish a communication from senior management to station personnel on standards, expectations, and consequences related to willful misconduct. The actual communication published in June 2010 did not indicate it was from senior management, and provided a minimal amount of information on standards and expectations. As published, it did not meet the intent of raising awareness. In November 2010, following the inspection activities, Millstone published a revised station communication from the Site Vice President that clearly articulated the standards, expectations, and consequences associated with willful misconduct. The inspectors determined that this issue was minor.

Secondly, the station's implementation of corrective actions intended to raise awareness for vendor management in the area of willful misconduct was limited in scope, and some vendors were not included. The inspectors determined that this issue was minor.

.2 (Closed) Unresolved Item 05000423/2010006-01, Broken Jacket Water Banjo Bolt Adversely Affected 3'B' EDG Operability (71152)

a. Inspection Scope

In February 2010, a degraded jacket water fitting (banjo bolt) on the 3'B' EDG resulted in extended EDG unavailability when a significant jacket water (JW) system leak

occurred during EDG testing. The details of this issue were previously identified and documented in the 2010 NRC Problem Identification and Resolution team inspection report, 05000336,423/2010006. In this report, the NRC opened Unresolved Item (URI) 05000423/2010006-01 to track Dominion's additional actions that were needed to fully evaluate and characterize the potential performance deficiency.

To close URI 05000423/2010006-01, the inspectors reviewed the details associated with the February 2010 issue and Dominion's subsequent evaluation. The inspectors also reviewed additional CAP documents to evaluate Dominion's apparent cause and extent of condition review (CR 370566).

b. Findings

Introduction: The inspectors identified a Green, NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," in that Dominion did not take adequate corrective actions for a condition adverse to quality involving an unanticipated failure discovered during maintenance on the 3'B' EDG. Specifically, maintenance workers identified a broken JW banjo bolt on the No. 13 cylinder in September 2009; however, they did not initiate a CR for the issue. Subsequently, a similarly degraded JW banjo bolt on the No. 3 cylinder resulted in extended unavailability of the 3'B' EDG in February 2010.

Description: On July 22, 2009, Dominion initiated CR 343051 to address minor JW leakage from the No. 13 cylinder on the 3'B' EDG. Dominion estimated the leak rate at approximately 60 drops per minute and determined that it did not have the potential to impact EDG operability. Dominion closed the CR to work order (WO) 53102270827. On September 22, 2009, operators tagged out the 3'B' EDG for preventive maintenance on the service water side of the JW heat exchangers (WO 53102241548). Maintenance completed the planned work on the EDG and operators completed their pre-job briefing for EDG post-maintenance testing. As operators were clearing tags and aligning the EDG for testing, maintenance workers reported that during the performance of EDG minor maintenance (WO 53102283391) to check the leak tightness of the No. 13 cylinder banjo bolt, they had discovered that the gasket appeared crushed or the JW fitting could be possibly cracked. The operators recommended that an immediate repair be pursued. Since the JW banjo bolt tightness check was performed as minor maintenance and was not planned, there were no contingency parts on hand and a corrective maintenance WO was not ready in case of scope expansion. The emergent failure required draining the JW system and resulted in extending 3'B' EDG unavailability (although still within the TS allowed outage time). On September 22, 2009, maintenance workers repaired the JW leak by replacing a degraded banjo bolt on the No. 13 cylinder (WO 53102270827). Maintenance documented an "unanticipated failure" of the broken banjo bolt in the WO package. Operations and maintenance supervision reviewed and closed WO 53102270827 with no additional actions.

On February 11, 2010, operations noted excessive JW leakage from the No. 3 cylinder during a 3'B' EDG monthly test, immediately declared the EDG inoperable, performed a controlled shutdown of the EDG, and initiated CR 368610. NRC inspectors walked down the 3'B' EDG shortly after it was shut down and noted that operations had made

an appropriate operability call based upon the amount of water that had leaked and the magnitude of the JW leak rate after the EDG had been shutdown. Dominion determined that the JW leak was from a cracked banjo bolt, which resulted in about twenty hours of unplanned 3'B' EDG unavailability. Maintenance replaced the banjo bolt on the No. 3 cylinder, and operations declared the EDG operable on February 12, 2010. On February 22, 2010, maintenance replaced all the banjo bolts on the 3'B' EDG, resulting in approximately ten hours of additional unavailability. On February 23, 2010, preliminary results from a magnetic particle inspection of the banjo bolts removed from the 3'B' EDG revealed seven additional cracked bolts (CR 369856). On February 23, 2010, maintenance replaced all the banjo bolts on the redundant 3'A' EDG to address the extent-of-condition. Dominion's initial review of the banjo bolts removed from 3'A' EDG did not identify any degraded bolts similar to those removed from 3'B' EDG.

The inspectors noted that Dominion took prompt and appropriate corrective actions following the emergent banjo bolt failure on February 11, 2010; however, the inspectors identified that Dominion had not initiated a CR in September 2009 when they had identified the first failed banjo bolt. The inspectors noted that this represented a missed opportunity to evaluate the deficiency within Dominion's CAP, and may have precluded the emergent 3'B' EDG unavailability in February 2010. Specifically, Dominion procedure PI-AA-200, "Corrective Action," listed examples of conditions that require a CR, several of which were applicable to the "unanticipated failure" of the banjo bolt, including 1) deficiencies or adverse conditions identified during performance of work, 2) a component failure that is outside of what would normally be expected, and 3) documentation of equipment failures. If Dominion had evaluated the banjo bolt failure within their CAP, they may have inspected a sample of banjo bolts and/or proactively replaced all the banjo bolts on 3'B' EDG during a planned December 2009 work window.

Dominion initiated CR 370566 for not identifying the degraded JW banjo bolt condition in the CAP in September 2009, and to evaluate potential generic concerns in this area. The inspectors reviewed Dominion's analysis following the failed banjo bolt in February 2010, and determined that the analysis was acceptable. Dominion determined the failure mechanism was related to a chemical cleaning to remove fuel oil contamination of the JW system, performed in 1996 only on the 3'B' EDG. Specifically, residual chemicals became trapped in the low flow annular area of the banjo bolts that led to a slow inter-granular attack of the bolting. None of the banjo bolts associated with 3'A' EDG were found with similar degradation.

Analysis: The inspectors determined that the failure to take adequate corrective action following identification of a degraded condition (broken banjo bolt) was a performance deficiency that was reasonably within Dominion's ability to foresee and prevent. This issue is similar to the more than minor example, 4.f, of IMC 0612, Appendix E, "Examples of Minor Issues." Specifically, the degraded condition subsequently adversely impacted EDG operability. Additionally, the finding was more than minor because it impacted 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. Traditional enforcement does not apply because

prevent undesirable consequences. 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.

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 it was not a design or qualification deficiency, did not represent an actual loss of system safety function of a single train for greater than its TS allowed outage time, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

This finding had a cross-cutting aspect in the Problem Identification and Resolution cross-cutting area, Corrective Action Program component, because Dominion did not ensure that issues potentially impacting nuclear safety were promptly identified, fully evaluated, and that actions were taken to address safety issues in a timely manner, commensurate with their safety significance. Specifically, Dominion did not initiate a CR in September 2009 for a degraded condition on the safety-related Unit 3, 'B' EDG. [P.1(a)]

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 September 22, 2009, to February 11, 2010, Dominion did not take adequate corrective action to identify and correct an unanticipated failure of a JW banjo bolt prior to the condition adversely impacting 3'B' EDG operability. Dominion maintenance workers replaced all the banjo bolts on the 3'B' EDG. Because this issue is of very low safety significance (Green) and because it is entered into Dominion's CAP (CR 370566), the NRC is treating this finding as an NCV, consistent with Section 2.3.2 of the NRC's Enforcement Policy. **(NCV 05000423/2010005-02, Failure to Take Adequate Corrective Actions for a Broken JW Banjo Bolt on the 3B EDG).**

#### 40A6 Meetings, Including Exit

##### Exit Meeting Summary

On January 4, 2011, the resident inspectors presented the overall inspection results to Mr. A. J. Jordan and members of his staff. The inspectors confirmed that no proprietary information was provided or examined during the inspection.

#### 40A7 Licensee-Identified Violations

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



- TS 3.7.2.1 states that the TDAFW pump has an allowable outage time of 72 hours. TS 4.0.1 requires that the licensee shall declare the TDAFW pump to be inoperable if the pump fails a surveillance test required by TSs. Contrary to this requirement, the TDAFW pump failed a surveillance test on June 30, 2010, and was inoperable for a period of approximately 54 days, which exceeded the TS allowable outage time. Dominion was not aware of the surveillance test failure until an extent of condition review triggered by another failed surveillance test on August 19, 2010, revealed that the TDAFW pump had failed the earlier test. Upon discovery, Dominion restored operability by repairing 3FWA\*RV45 and placed the condition in the CAP (CR392003 and CR392155). This finding is of very low safety significance because the TDAFW pump was available to fulfill its safety function during the period of time that it was inoperable.

ATTACHMENT: SUPPLEMENTAL INFORMATION

**SUPPLEMENTAL INFORMATION****KEY POINTS OF CONTACT****Dominion personnel**

L. Armstrong	Manager, Training
G. Auria	Nuclear Chemistry Supervisor
B. Barron	Manager, Nuclear Oversight
B. Bartron	Supervisor, Licensing
C. Chapin	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. Curlin	Manager, Protection Services
J. Dorosky	Health Physicist III
M. Finnegan	Supervisor, Health Physics, ISFSI
A. Gharakhanian	Nuclear Engineer III
W. Gorman	Supervisor, Instrumentation & Control
J. Grogan	Assistant Operations Manager
K. Grover	Manager, Operations
C. Houska	I&C Technician
A. Jordan	Site Vice President
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
J. Plourde	Nuclear Engineer III
R. Riley	Supervisor, Nuclear Shift Operations Unit 3
M. Roche	Senior Nuclear Chemistry Technician
M. Sartain	Director, Engineering
L. Salyards	Licensing, Nuclear Technology Specialist
J. Semancik	Plant Manager
A. Smith	Asset Management
D. Smith	Manager, Emergency Preparedness
S. Smith	Manager, Engineering
J. Stoddard	Shift Manager, Unit 3
S. Turowski	Supervisor, Health Physics Technical Services
C. Vournazos	IT Specialist, Meteorological Data

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

### Closed

URI	05000423/2010006-01	Broken Jacket Water Banjo Bolt Adversely Affected EDG 3'B' Operability (Section 4OA5)
LER	05000423/2010-002	Automatic Reactor Trip on Lo Lo 'C' Steam Generator Water Level (Section 4OA3)
LER	05000423/2010-004	Inoperable Turbine Driven Auxiliary Feedwater Pump due to Degraded Relief Valve (Section 4OA3)

### Opened and Closed

FIN	05000336/2010005-01	Failure to Provide an Adequate Procedure for Backwashing Condenser Water Boxes (Section 4OA3)
NCV	05000423/2010005-02	Failure to Take Adequate Corrective Actions For a Broken Jacket Water Banjo Bolt on the 3'B' EDG (Section 4OA5)

## LIST OF DOCUMENTS REVIEWED

### **Section 1R01: Adverse Weather Protection**

COP 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 2350, "Refueling Water Storage Tank Temperature Control," Revision 014-04  
OP 3314G, "Intake Structure Ventilation," Revision 009-06  
OP 3352, "Heat Tracing," Revision 013-05  
CR395912  
CR396442  
CR397146  
CR402831  
CR402952  
CR403002  
CR403091  
CR403414

### **Section 1R04: Equipment Alignment**

OP 2322-01, "Auxiliary Feedwater System Lineup," Revision 000-01  
OP3346A, "EDG," Revision 024-04  
OP3346A Form 001, "EDG 'A' Cooling Water Valve Line Up," Revision 007

OP3346A Form 003, "EDG 'A' Lube Oil Valve Line Up," Revision 006-01  
OP3346A Form 005, "EDG 'A' Starting Air Valve Line Up," Revision 008-04  
OP3346A Form 007, "EDG 'A' Crank Case Vacuum Valve Line Up," Revision 005  
OP3346A Form 009, "EDG 'A' Instrument Valve Lineup," Revision 006-01  
OP3346A Form 011, "EDG 'A' Electrical Line Up," Revision 009-01  
OP3346B, Diesel Fuel Oil," Revision 101-03  
OP3346B Form 001, "Valve Line Up for 'A' Diesel Fuel System," Revision 4  
OP3346B Form 003, "A' Diesel Fuel Oil Instrument Valve Line Up," Revision 4  
OP3336B Form 006, "A' Diesel Fuel Oil Electrical Alignment," Revision 000-01

**Section 1R05: Fire Protection**

Millstone Unit 2 Fire Hazards Analysis, Revision 9  
Millstone Unit 3 Firefighting Strategies, Revision 2  
Millstone Unit 3 Fire Protection Evaluation Report, Revision 17.3  
EOP 3509.1, "Control Room, Cable Spreading Area or Instrument Rack Room Fire," Revision 013  
EOP 3509.28, "Main Steam Valve Enclosure Fire," Revision 0

**Section 1R06: Flood Protection Measures**

Millstone 3 Internal Flooding Evaluation  
P(R)-1071, "Aux Building Flood Study: Maximum obtainable height of Flood Water in the Aux Bldg Due to a Pipe Break," Revision 0-1

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

AOE #3, "Millstone Unit 2 LORT Annual Operating Exam," Revision 5/0  
LORT SE47, Revision 2  
LORT SE29, Revision 2

**Section 1R12: Maintenance Effectiveness**

ER-AA-MRL-100, "Implementing Maintenance Rule," Revision 4  
System Health Report, Station Blackout Diesel 2010 3<sup>rd</sup> Quarter  
System Health Report, 3322 Auxiliary Feedwater 2009 4<sup>th</sup> Quarter  
System Health Report, 3322 Auxiliary Feedwater 2010 1<sup>st</sup> Quarter  
System Health Report, 3322 Auxiliary Feedwater 2010 2<sup>nd</sup> Quarter  
System Health Report, 3322 Auxiliary Feedwater 2010 3<sup>rd</sup> Quarter  
Maintenance Rule Scoping table for SBO Diesel Generator  
Maintenance Rule Scoping table for the AFW System  
MRE010392  
MRE010628  
MRE010710  
MRE011854  
MRE011863  
MRE011892  
MRE012168  
MRE010914 FW check valves leaked by  
MRE011826 Relief Valve 3FWA\*RV64A failed high  
MRE011938 FW Check Valve Operability Test failed  
MRE011948 AFW Suction Pressure

MRE012026 AFW Control Valve Failed to open fully  
MRE012041 3FWA\*HV31C Stroked open 25 percent  
MRE012052 Leakage past 3FWA\*P1B vent valve  
MRE012292 TDAWF rack setting was low  
MRE012515 Millstone Unit 3 Terry Turbine INOPERABLE due to RV45 leaking  
MRE012519 TDAW pump failed surveillance SP3622.3-001 in June  
CR372956  
CR373226  
CR392045, "TDAFW pump had high out of spec recirc flow," dated August 21, 2010  
ACE018315, "TDAFW pump had high out of spec recirc flow," dated October 30, 2010

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

AWO 53M30410908, "PM 5 year molded case breaker cycling, M332-1U(3K)"  
AWO 53M30715129, "PM 5A-DC Molded Case Breaker Cycling M33BYS\*PNL2(06)"  
AWO 53M30119120  
C MP 782AE, "Overcurrent Device Testing for MCC and Molded Case Breakers," Revision 002  
DM2-00-057-10, "RS1 Transfer Switch Bypass Tie-in," Revision 0  
Medium/High Risk Contingency Plan Actions for VR-11  
OP 2326A, "Service Water System," Revision 023-08  
SPROC ENG10-2-003, "Millstone Unit 2 VR-11/21 UPS (ICCE) MMOD DM2-00-0057-10  
Implementation," Revision 00-01  
Troubleshooting plan for CR 400684  
CR 400684  
CR403794, "Breaker for 3EGF\*TRS1A failed over current testing," dated November 15, 2010  
CR403788, "Contactor coil in 32-1U (4M) found degraded. Replacement complete," dated  
November 15, 2010  
CR406307  
CR408418

**Section 1R15: Operability Evaluations**

25203-26005, Sheet 2, "Piping & Instrument Diagram Feed System"  
25203-30044, Sheet 17, "Schematic Diag., 4.16KV Bus 24C," Revision 11  
25203-32041, Sheet 10, "DG 15G-12U Exciter Control," Revision 4  
125203-32041, Sheet 11, "DG 15G-12U Auto-Manual Voltage Control," Revision 10  
25203-39038, Sheet 11, "Schematic and Interconnection Diagram for Series Boost Exciter  
Voltage Regulator," Revision 2  
DCN DM3-00-0152-10, "Replace Motor Heaters for 3CHS\*P3C"  
Memo to file, "3SWP\*AOV39A Valve Body, Disc and Seat Retainer Ring Erosion," by D. Perry  
dated October 27, 2010  
ODM 000170, "Operation of 3CHS\*V368 failed open," dated September 28, 2010  
System Health Report 3346A, "EDG and EDG Fuel Oil," dated 4<sup>th</sup> Quarter 2009  
CR401027, "3SWP\*AOV39A Valve Body, Disc and Seat Retainer Ring Erosion," dated October  
27, 2010  
CR 08-04889  
CR321796  
CR3988186, "Non-QA Part Installed into Millstone Unit 3 Charging Pump Motor," dated October  
7, 2010  
CR400980

CR402188

CR393982

Drawing 25212-26904 Sheet 1, "Chemical and Volume Control," Revision 51

CR403794, "Breaker for 3EGF\*TRS1A failed over current testing," dated November 15, 2010

CR403943, "Received loss of control power alarm for 3EGF\*P1C breaker 32-1T(2K)," dated November 16, 2010

CR403972, "74 Relay for 32-1T(2K) found failed," dated November 16, 2010

System Health Report 3346A Emergency Diesel Generator, 4<sup>th</sup> quarter 2009

NEMA AB-4, "Circuit Breaker Testing"

UL Standard 489

C MP 782AE, "Overcurrent Device Testing for MCC and Molded Case Circuit Breakers," Revision 002

AWO 53M30410908, "M332-1U(3K) PM 5 Yr Mld Case Bkr Cycling"

**Section 1R18: Plant Modifications**

DM2-03-0301-09, "Leak Encapsulation of #2 SG Feedwater High Point Vent Valve, M22-FW-261B," Revision 0

53102390517

CR404726

CR404739

**Section 1R19: Post Maintenance Testing**

AWO 53M30410908, "PM 5 year molded case breaker cycling, M332-1U(3K)"

AWO 53M30715129, "PM 5A-DC Molded Case Breaker Cycling M33BYS\*PNL2(06)

AWO 53M30119120

WW1046 3EDG\*EGB, Outage November 15, 2010 to November 16, 2010 FEG Notes

WW1046 3EGF\*TK1B, Entry for November 17, 2010 FEG Notes

C MP 782AE, "Overcurrent Device Testing for MCC and Molded Case Breakers," Revision 002

OP3346A, "EDG," Revision 024-04

OP 2346A-004, "'A' DG Data Sheet," Revision 023-08

SP 2613K-002 "DG Slow Start Operability Determination Test, Facility 1 (Quick Start)," Revision 002-05

CR393943, "Millstone Unit 3 Degrading seat leakage trend for valve 3SWP\*AOV39A," dated September 8, 2010

CR394151, "'A' Train SWP pump Op test does not account for 3SWP\*AOV39A leak by," dated September 10, 2010

CR394189, "Degrading condition (3SWP\*AOV39A) adversely affected Tech Spec Surveillance," dated September 10, 2010

CR394213, "Procedure enhancements due to 3SWP\*AOV39A leakage," dated September 10, 2010

CR403710, 'A' EDG enclosure damper HVP\*MOD26A indicated dual position

CR403788, "Contactor coil in 32-1U (4M) found degraded. Replacement complete," dated November 15, 2010

CR403794, "Breaker for 3EGF\*TRS1A failed over current testing," dated November 15, 2010

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

OP 2204, "Load Changes," Revision 023-03

OP 2205, "Plant Shutdown," Revision 015-04

OP 2206, "Reactor Shutdown," Revision 011-02  
OP 2207, "Plant Cooldown," Revision 028-05  
CR404726  
CR404739

**Section 1R22: Surveillance Testing**

ETE-NAF-2010-0073, "Proposed Interim Compensatory Measures for Hypothetical Larger Than Expected Millstone Unit 2 Spent Fuel Pool Boraflex Loss," Revision 0  
PM01414, "Supporting Calculations for Millstone Unit 2 Spent Fuel Pool Boraflex Compensatory Measures," Revision 0  
CR404562  
53102395860

**Section 2RS01/2RS05/2RS11: Radiological Hazard Assessment and Exposure Controls, Radiation Monitoring Instrumentation and Licensed Operator Requalification**

Procedures

RPM 4.6.24, Revision 7, Small Articles Monitor Calibration  
RPM 4.8.11, Revision 8, Whole Body Contamination Response Checking  
RPM 4.8.9, Revision 10, Small Articles Monitor Operation  
RPM 4.6.6, Revision 5, Electronic Dosimeter Calibration Verification and Response Check  
RPM 4.6.29, Revision 2, Canberra ARGOS 4AB Contamination Monitor Calibration & Quality Assurance  
RPM 4.1.11, Revision 3, AMS-4 Air Monitoring System Calibration  
RPM 4.6.27, Revision 3, MGP-AMP-100/AMP 50 Dose Rate Meter Calibration  
RPM 4.8.1, Revision 6, Measuring the Radiation Intensity of the J. L. Shepherd Calibrator  
EN 21235, Revision 3, Millstone Unit 2 Radiation Monitor High Radiation Setpoints  
EN31153, Revision 5, Millstone Unit 3 Radiation Monitor High Radiation Setpoints  
RP-AA-103, Revision 0, ALARA Program  
RP-AA-103, 1000, Revision 0, Station ALARA Committee  
RP-AA-201, Revision 5, Access Controls for High and Very High Radiation Areas  
RP-AA-202, Revision 4, Radiological Posting  
RP-AA-226, Revision 0, Alpha Monitoring  
RP-AA-320, Revision 3, Personnel Contamination Monitoring and Decontamination  
RP-AA-300, Revision 2, ALARA Reviews and Reports  
RP-AA-301, Revision 0, ALARA Goals  
EP-AA-303, Revision 0, Equipment Important to Emergency Response

Observation of Daily Functional Checks or Calibrations

Portable Survey Instruments

\*RO-2, Serial No. 720  
\*\*AMP-100, Serial No. 5003-015

Contamination Monitors

\*SAM-11, Serial Nos. 494, 495  
\*SAM 12, Serial No.159  
\*ARGOS 4A/B, Serial Nos 121, 123, 137  
\*PM-7, Serial Nos 560, 565  
\*\*\*SAC-4, Serial No. 1452

- \*\*\*BC-4, Serial No. 1022
- \* Observed Daily Source Checks
- \*\*Observed Calibration
- \*\*\* Reviewed Daily Quality Control Checks

Calibration Records Reviewed

Calibrators

Shepherd Calibrator Model 89, Serial Nos. 9068, 9155

Electronic Dosimeters

Serial Nos. 07705, 15713, 05335, 075385, 06660, 07866, 06189, 07051, 141289, 126878, 141170

Contamination Monitors

ARGOS 4AB, Serial Nos. 093, 096, 151, 137, 148, 136, 121, 120, 122, 123, 150, 095  
SAM 9, Serial Nos. 071, 072, 042  
SAM 11, Serial Nos. 497, 494, 495, 498, 597  
SAM 12, Serial Nos. 129, 159, 150, 140, 144, 145  
PCM-1B, Serial No. 535  
SAC-4 , Serial No. 1452, 1451  
43-2, Serial Nos. 7485, 7496, 21372, 21370,

Neutron Survey Instrument

REM-500, Serial Nos. 187, 234

Laboratory Instruments

Gamma Spectroscopy Detector Nos. 1, 2, 3, 4, 7, 8, 11, 12, 13, 15, 16, 20  
Scintillation Counter Packard Tri-Carb Nos. 422931, 422932

Whole Body Counting Systems

FastScan whole body counting system

In-Plant Monitors

Unit 2

Containment Gaseous & Particulate Process Radiation Monitor (RM-8123)  
Aerated Liquid Rad Waste Process Radiation Monitor (RM-9116)  
Spent Fuel Pool Area Radiation Monitor (RM-8142)  
Waste Gas Process Radiation Monitor (RM-9095)  
Reactor Building Closed Cooling Water Radiation Monitor (RM-6038)  
Clean Liquid Rad Waste Process Radiation Monitor (RM-9049)

Unit 3

Containment Area High Range Radiation Monitor (3RMS\*RIY05A)  
Waste Neutralization Sump Radiation Monitor (3CND-RIY07)  
Ventilation Vent Stack High Range Radiation Monitor (3HVR\*RIY10A)  
Ventilation Vent Stack Normal Range Radiation Monitor (3HVR\*RIY10B)  
Supplemental Leak Collection and Release System High Range Radiation Monitor (3HVR\*RIY19A)



Incore Area Kaman Scientific Area Radiation Monitor (3RMS-31)  
Control Room Area Kaman Scientific Area Radiation Monitor (3RMS-22)  
Fuel Storage Pool Area Radiation Monitors (3RMS-RIY08 & RIY36)  
Liquid Waste Radiation Monitor (3LWS-RIY70)  
Turbine Building Floor Drains Radiation Monitor (3DAS-RIY50)

Other Documents

2010 Annual Verification of J. L. Shepherd SN 9155  
2010 Annual Verification of J. L. Shepherd SN 9068  
Electronic Dosimetry Dose/Dose Rate Alarm Reports from April 12, 2010 through November 15, 2010  
Monthly, Quarterly, and Annual Liquid & Gaseous Effluent Dose Assessments for Unit 2 and Unit 3  
2R19 Outage Characterization Summary Report  
3R13 Outage Characterization Summary Report  
Design Change Notice DM2-00-0015-10, Shift Output Scaling Waste Gas RM-9095

Condition Reports

390746, 398918, 388737, 390793, 395965, 395976, 381125, 384436, 381125, 360363

Training Program Procedures

Licensed Operator Requalification Training (LORT), TPD-7.080, Revision 12 Change 4  
Training Review Boards, TR-AA-510, Revision 8  
2010 LORT Annual Operating Test Sample Plan

Job Performance Measures (JPMs)

018, 029, 040, 045, 048, 060, 067, 083, 123, 124, 156, 161, 161, 162, 177, 206, 220, 230, 234, A45

Scenarios

1, 2, 5, 7, 8, 28

Written Examinations

0016793, 0016794, 0016795

Simulator-Related Documentation

Simulator DR 2007-2-0062, DM2-00-0186-07, Unit 2 BAST Level Transmitter and Lo-Lo Setpoint Change  
Simulator DR 2008-2-0037, Upgrade of MP2 RSST Primary Channel Audio Tone System  
Simulator DR 2008-2-0042, Main FRV Lock Up on Loss of VR11 and VR21  
Simulator DR 2008-2-0046, Charging Pump Control Scheme - PTL Modifications  
Simulator DR 2008-2-0084, Remove Hydrogen Recombiner Annunciator Trip Window  
Simulator DR 2009-2-0044, FRV Response on Loss of VR11 and VR21  
Simulator DR 2009-2-0049, Gravity Feed Through Aux Spray Valve  
Simulator DR 2009-2-0055, MSI Signal Locks Up the Feed Regulating Valves  
Simulator DR 2010-2-0006, ESAS CR on UV Latching  
Simulator DR 2010-2-0011, Charging Pump White Lights on C-01X when in PTL  
Simulator DR 2010-2-0010, FW Regulating Valve Not Locking Up as Expected

Simulator Cycle 20 MOL Core Performance Test  
Simulator 2010 Steady-State Tests for 40 percent, 70 percent and 100 percent Power  
Simulator 2010 Transient Test TT1, Manual Reactor Trip  
Simulator 2010 Transient Test TT4, Simultaneous Trip of All RCPs  
Simulator 2010 Transient Test TT11, Maximum Load Rejection  
Simulator 2010 Normal Operating Test

**Section 40A1: Performance Indicator (PI) Verification**

LER 05000336/2009-003-00, "Two Independent DG Rendered Inoperable Due to Common Cause"  
LER 05000336/2009-003-01, "Two Independent DG Rendered Inoperable Due to Common Cause"  
LER 05000336/2009-004-00, "Overdue ASME Code Required In Service Test Did Not Meet Acceptance Criteria"  
LER 05000336/2009-005-00, "Both Containment Air Lock Doors Open in Mode 1"  
LER 05000336/2010-001-00, "Millstone Unit 2 Reactor Trip"  
LER 05000336/2010-002-00, "Manual Reactor trip on High SG Level"  
LER 05000423/2008-005-01, "Containment Penetration Not Fully closed During Fuel Movement"  
LER 05000423/2009-002-00, "Millstone Unit 3 Automatic Reactor Trip"  
LER 05000423/2010-002-00, "Automatic Reactor Trip on Lo SG Level"  
LER 05000423/2010-003-00, "Secondary Containment Rendered Inoperable Due to Misaligned Dampers"  
LER 05000423/2010-004-00, "Inoperable Turbine Driven Auxiliary Feed Pump Due to Degraded Relief Valve"

**Section 40A2: Identification and Resolution of Problems**

Corrective Action Program Trend Report, 2<sup>nd</sup> Quarter 2010  
Corrective Actions Performance Indicators August 2010  
Equipment Reliability Performance Indicators August 2010  
Human Performance Index Performance Indicators August 2010  
RCE001025, "August 2010 INPO AFI ER2.2, Inadequate standards for Late and Deferred PMs," Revision 0  
CR381824  
CR382383  
CR385130  
CR386692  
CR387535  
CR391393  
CR401719  
CR402842  
CR403210  
CR403240

**Section 40A3: Event Follow-up**

OP 2202, "Reactor Startup ICCE," Revision 022-01  
OP 2203, "Plant Startup," Revision 019-02  
CR405377

CR405379  
CR405404

**Section 40A5: Other Activities**

Collective Significance Evaluation CR364058  
Addendum to Collective Significance Evaluation CR364058  
CR-08-05433  
CR332878  
CR113021  
CR369728  
CR372524  
CR395530  
CR395532  
CR398221  
CA167236  
CA167237  
CA167238  
CA167239  
CA167240  
CCA000109  
PI-AA-200, "Corrective Action," Revision 12  
PI-AA-200-2002, "Effectiveness Reviews," Revision 3  
PI-AA-300, "Cause Evaluation," Revision 5  
PI-AA-300-3003, "Common Cause Evaluation," Revision 0  
Dominion IT Policy 400, "ID & Authentication," dated December 31, 2009  
Dominion Principles of Professionalism  
Corrective Action Review Board Meeting Minutes, dated September 28, 2010  
Plant Access Training slides  
Dominion Criminal History Self Disclosure Forms, dated July 2010 and February 2009  
Millstone Site Communications "To the Point," dated June 30, 2010  
Millstone Site Communications "To the Point," dated November 3, 2010  
NRC letter to Dominion, "NRC Investigation Report No. 1-2008-051 Millstone Nuclear Power Plant," dated September 10, 2009 [ML092530157]  
NRC letter to Dominion, "NRC Investigation Report Nos. 1-2009-018 and 1-2009-030; Millstone Nuclear Power Plant," dated December 14, 2009 [ML093480369]  
NRC Office of Investigations Case No. 1-2008-051, dated April 23, 2009  
NRC Office of Investigations Case No. 1-2009-018, dated August 4, 2009  
NRC Office of Investigations Case No. 1-2008-030, dated August 26, 2009  
ACE018046  
CR369962  
CR370566  
PI-AA-200, "Corrective Action," Revision 14

## LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
AFW	Auxiliary Feedwater
ALARA	As Low As Reasonably Achievable
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CLB	Current Licensing Basis
CR	Condition Report
CW	Circulating Water
DG	Diesel Generator
DNB	Departure from Nucleate Boiling
DNC	Dominion Nuclear Connecticut
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
EDG	Emergency Diesel Generator
EP	Emergency Preparedness
FRBV	Feed Regulating Bypass Valves
FSAR	Final Safety Analysis Report
HPSI	High Pressure Safety Injection
HRA	High Radiation Areas
I&C	Instrumentation and Control
IMC	Inspection Manual Chapter
JW	Jacket Water
LER	Licensee Event Reports
LHRA	Locked High Radiation Areas
mrem	millirem
MSPI	Mitigating System Performance Indication
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OD	Operability Determinations
OOS	Out Of Service
PARS	Publicly Available Records System
PI	Performance Indicator
PI&R	Problem Identification and Resolution
PM	Preventive Maintenance
PMT	Post Maintenance Testing
RCA	Radiologically Controlled Area
RCE	Root Cause Evaluation
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RSS	Recirculating Spray System
RWP	Radiological Work Permit

SBO	Station Blackout
SDP	Significance Determination Process
SG	Steam Generator
SL	Severity Level
SSFF	Safety System Functional Failures
SW	Service Water
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Issue
VFD	Variable Frequency Drive
VHRA	Very High Radiation Areas
WO	Work Order



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PA 19406-1415

March 3, 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 EMERGENCY PREPAREDNESS ANNUAL INSPECTION REPORT  
NOS. 05000336/2010501 AND 05000423/2010501; NRC SECURITY ANNUAL  
INSPECTION REPORT NOS. 05000336/2010401 AND 05000423/2010401

Dear Mr. Heacock:

On December 31, 2010, the NRC staff completed its annual inspection of the Emergency Preparedness Program at Millstone Power Station. This inspection began on January 1, 2010. Issuance of this letter closes Inspection Reports 05000336/2010501 and 05000423/2010501. 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, in some cases, performing traditional enforcement activities. Any observations and findings in this area were provided to you via separate correspondence.

On December 31, 2010, the NRC staff also completed its annual inspection of the Security Program at Millstone Power Station. This inspection began on January 1, 2010. Issuance of this letter closes Inspection Reports 05000336/2010401, and 05000423/2010401. Inspection activities charged to these reports include conducting mid-cycle/end of cycle assessment activities, following up on Suspicious Incident Database (SID) reports, responding to technical questions from resident inspectors or licensee personnel, and, in some cases, performing traditional enforcement activities. 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,

A handwritten signature in black ink, appearing to read "Silas R. Kennedy".

Silas R. Kennedy, Acting Chief  
Plant Support Branch 1  
Division of Reactor Safety

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

D. Heacock

2

cc:

J. Curling, Security Manager, Millstone Station

R. Douglas Frazier, New York State Office of Homeland Security

F. Murray, President and CEO, New York State Energy Research and Development Authority

S. Colman, RAC Chair, FEMA Region I

cc: Distribution via ListServ

March 3, 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 EMERGENCY PREPAREDNESS ANNUAL INSPECTION REPORT  
NOS. 05000336/2010501 AND 05000423/2010501; NRC SECURITY ANNUAL  
INSPECTION REPORT NOS. 05000336/2010401 AND 05000423/2010401**

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Sincerely,

/RA/

Silas R. Kennedy, Acting 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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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PA 19406-1415

March 4, 2011

Mr. David Heacock  
Sr. Vice President and Chief Nuclear Officer  
Dominion Resources  
500 Dominion Boulevard  
Glenn Allen, VA 23060-6711

SUBJECT: ANNUAL ASSESSMENT LETTER FOR MILLSTONE POWER STATION UNIT 2  
AND UNIT 3 (REPORT 05000336/2010001 and 05000423/2010001)

Dear Mr. Heacock:

On February 10, 2011, the Nuclear Regulatory Commission (NRC) completed its end-of-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 January 1, 2010, through December 31, 2010. 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 that overall, Millstone Power Station Unit 2 and Unit 3 operated in a manner that preserved public health and safety and met all cornerstone objectives. The NRC determined the performance at Millstone Power Station Unit 2 and 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 your facility.

The enclosed inspection plan lists the inspections scheduled through June 30, 2012. Routine inspections performed by resident inspectors are not included in the inspection plan. 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.

D. Heacock

2

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 document 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 me at 610-337-5306 with any questions you have regarding this letter.

Sincerely,

A handwritten signature in black ink, appearing to read "Donald E. Jackson". The signature is fluid and cursive, with the first name "Donald" being the most prominent.

Donald E. Jackson, Chief  
Projects Branch 5  
Division of Reactor Projects

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

Enclosure: Millstone Inspection/Activity Plan

ccw/encl. Distribution via ListServ

D. Heacock

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Please contact me at 610-337-5306 with any questions you have regarding this letter.

Sincerely,

/RA/

Donald E. Jackson, Chief  
Projects Branch 5  
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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Millstone

Inspection / Activity Plan

01/01/2011 - 06/30/2012

Unit Number	Planned Dates Start	Planned Dates End	Inspection Activity	Title	No. of Staff on Site
3	06/13/2011	06/17/2011	07/11EXM - OPERATOR LICENSING INITIAL EXAMS		4
			U01832	FY11- MILLSTONE 3, INITIAL OL EXAM	
3	07/11/2011	07/20/2011	U01832	FY11- MILLSTONE 3, INITIAL OL EXAM	
2	06/27/2011	07/01/2011	3/14EXM - INITIAL OPERATOR LICENSING U2 EXAMS		3
			U01834	FY11- MILLSTONE 2, INITIAL OL EXAM	
2	07/25/2011	08/05/2011	U01834	FY11- MILLSTONE 2, INITIAL OL EXAM	
2, 3	02/28/2011	03/04/2011	71124 - OCC RAD SAFETY		1
			IP 71124.01	Radiological Hazard Assessment and Exposure Controls	
2, 3	02/28/2011	03/04/2011	IP 71124.02	Occupational ALARA Planning and Controls	
2	04/11/2011	04/22/2011	7111108P - U2 INSERVICE INSPECTION		1
			IP 7111108P	Inservice Inspection Activities - PWR	
2, 3	04/18/2011	04/22/2011	71124 - OCC RAD SAFETY		1
			IP 71124.01	Radiological Hazard Assessment and Exposure Controls	
2, 3	04/18/2011	04/22/2011	IP 71124.02	Occupational ALARA Planning and Controls	
2, 3	04/18/2011	04/22/2011	IP 71124.04	Occupational Dose Assessment	
2, 3	05/23/2011	05/27/2011	71124 - EFFLUENTS		1
			IP 71124.06	Radioactive Gaseous and Liquid Effluent Treatment	
2, 3	08/29/2011	09/02/2011	711111B - MS3 REQUAL INSP W/ P/F RESULTS		2
			IP 711111B	Licensed Operator Requalification Program	
2, 3	08/01/2011	08/05/2011	EP PROGR - EP PROGRAM INSPECTION		1
			IP 7111402	Alert and Notification System Testing	
2, 3	08/01/2011	08/05/2011	IP 7111403	Emergency Preparedness Organization Staffing and Augmentation System	
2, 3	08/01/2011	08/05/2011	IP 7111404	Emergency Action Level and Emergency Plan Changes	
2, 3	08/01/2011	08/05/2011	IP 7111405	Correction of Emergency Preparedness Weaknesses and Deficiencies	
2, 3	08/01/2011	08/05/2011	IP 71151-EP02	ERO Drill Participation	
2, 3	08/01/2011	08/05/2011	IP 71151-EP03	Alert & Notification System	
2, 3	08/01/2011	08/07/2011	IP 71151-EP01	Drill/Exercise Performance	
2, 3	08/22/2011	08/26/2011	71124 - PUB RAD SAFETY - REMP		1
			IP 71124.07	Radiological Environmental Monitoring Program	
2, 3	10/17/2011	10/21/2011	71124 - OCC RAD SAFETY		1
			IP 71124.01	Radiological Hazard Assessment and Exposure Controls	
2, 3	10/17/2011	10/21/2011	IP 71124.02	Occupational ALARA Planning and Controls	
2, 3	10/17/2011	10/21/2011	IP 71124.04	Occupational Dose Assessment	
3	10/17/2011	10/28/2011	7111108P - U3 INSERVICE INSPECTION		1
			IP 7111108P	Inservice Inspection Activities - PWR	

This report does not include INPO and OUTAGE activities.  
 This report shows only on-site and announced inspection procedures.

Millstone

Inspection / Activity Plan

01/01/2011 - 06/30/2012

Unit Number	Planned Dates Start End	Inspection Activity	Title	No. of Staff on Site
2, 3	01/30/2012 02/03/2012	TI-177	- MANAGING GAS ACCUMULATION IN ECCS	1
		IP 2515/177	Managing Gas Accumulation In Emergency Core Cooling, Decay Heat Removal & Containment Spray System	
		EP EX	- EP EXERCISE EVALUATION	5
2, 3	02/27/2012 03/02/2012	IP 7111401	Exercise Evaluation	
2, 3	02/27/2012 03/02/2012	IP 7111404	Emergency Action Level and Emergency Plan Changes	
		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	
		711121	- CDBI	6
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	

This report does not include INPO and OUTAGE activities.  
This report shows only on-site and announced inspection procedures.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

March 7, 2011

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

**SUBJECT: KEWAUNEE POWER STATION, MILLSTONE POWER STATION UNITS 2 AND 3, NORTH ANNA POWER STATION UNITS 1 AND 2, SURRY POWER STATION UNITS 1 AND 2 - REQUEST FOR ADDITIONAL INFORMATION RELATED TO LICENSE AMENDMENT REQUEST FOR APPROVAL OF CYBER SECURITY PLAN (TAC NOS. ME4319, ME4320, ME4321, ME4322, ME4323, ME4324, AND ME4325)**

Dear Mr. Heacock:

By letter to the U.S. Nuclear Regulatory Commission (NRC) dated November 20, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML093360247), as supplemented by letters dated July 12, 2010 (ADAMS Accession No. ML102010091), August 5, 2010 (ADAMS Accession No. ML102210284), September 23, 2010 (ADAMS Accession No. ML102670641), November 10, 2010 (ADAMS Accession No. ML103160422) and December 13, 2010 (ADAMS Accession No. ML103560083), Dominion Electric Kewaunee, Inc., Dominion Nuclear Connecticut, Inc., and Virginia Electric and Power Company (collectively, the Dominion licensees) submitted amendments requesting NRC approval of a common fleet Cyber Security Plan.

The NRC staff is reviewing your submittal and has determined that additional information is required to complete the review. By monitored fax transmission on February 22, 2011, the draft Request for Additional Information (RAI) items were sent to Margaret Earle, a member of your staff.

Subsequent to that transmittal we are confirming that those RAI items (see Enclosure) are the final version to which to respond and that the requested date for the response is 30 days after the date of this letter (or the first workday thereafter, if the date falls on a weekend). The enclosed RAI items were reviewed in accordance with the guidance provided in 10 CFR Section 2.390. The NRC staff has determined that no security related or proprietary information is contained therein. Further, it was agreed that you would include the full text of each RAI item with your response as a record of these RAI items.

D. Heacock

- 2 -

The NRC staff considers that timely responses to requests for additional information help ensure that sufficient time is available for staff review and contribute toward the NRC's goal of efficient and effective use of staff resources. If circumstances result in the need to revise the requested response date, please contact me at (301) 415-3079.

Sincerely,

Handwritten signature of Karl D. Feintuch in black ink.

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

Docket Nos. 50-305, 50-336, 50-423,  
50-338, 50-339, 50-280, and  
50-281

Enclosure: As stated

cc w/encl: Distribution via ListServ

REQUEST FOR ADDITIONAL INFORMATION (RAI)  
REGARDING APPROVAL OF THE CYBER SECURITY PLAN  
KEWAUNEE POWER STATION,  
MILLSTONE POWER STATION UNITS 2 AND 3,  
NORTH ANNA POWER STATION UNITS 1 AND 2,  
SURRY POWER STATION UNITS 1 AND 2  
DOCKET NOS. 50-305, 50-336, 50-423, 50-338, 50-339, 50-280, AND 50-281

**RAI 1: Records Retention**

Title 10 of the Code of Federal Regulations (10 CFR) Paragraph 73.54(c)(2) requires licensees to design a cyber security program to ensure the capability to detect, respond to, and recover from cyber attacks. Furthermore, 10 CFR 73.54(e)(2)(i) requires licensees to maintain a cyber security plan that describes how the licensee will maintain the capability for timely detection and response to cyber attacks. The ability for a licensee to detect and respond to cyber attacks requires accurate and complete records and is further supported by 10 CFR 73.54(h), which states that the licensee shall retain all records and supporting technical documentation required to satisfy the requirements of 10 CFR Section 73.54 as a record until the Commission terminates the license for which the records were developed, and shall maintain superseded portions of these records for at least 3 years after the record is superseded, unless otherwise specified by the Commission.

The licensee's Cyber Security Plan (CSP) in Section 4.13 states that Critical Digital Asset (CDA) audit records and audit data (e.g., operating system logs, network device logs) are retained for a period of time that is less than what is required by 10 CFR 73.54(h).

Explain the deviation from the 10 CFR 73.54(h) requirement to retain records and supporting technical documentation until the Commission terminates the license (or to maintain superseded portions of these records for at least 3 years) and how that meets the requirements of 10 CFR 73.54.

**RAI 2: Implementation Schedule**

The regulation at 10 CFR 73.54, "Protection of digital computer and communication systems and networks," requires licensees to submit a CSP that satisfies the requirements of this section for Commission review and approval. Furthermore, each submittal must include a proposed implementation schedule and the implementation of the licensee's cyber security program must be consistent with the approved schedule. Paragraph 73.54(a) of 10 CFR requires licensees to provide high assurance that digital computer and communication systems and networks are adequately protected against cyber attacks, up to and including the design basis threat.

Enclosure



The completion of several key intermediate milestones (Items (a) through (g) below) would demonstrate progress toward meeting the requirements of 10 CFR 73.54. The Nuclear Regulatory Commission (NRC) staff's expectation is that the key intermediate milestones will be completed in a timely manner, but no later than December 31, 2012. The key CSP implementation milestones are as follows:

- (a) Establish, train and qualify Cyber Security Assessment Team, as described in Section 3.1.2, "Cyber Security Assessment Team," of the CSP
- (b) Identify Critical Systems and CDAs, as described in Section 3.1.3, "Identification of Critical Digital Assets," of the CSP.
- (c) Implement cyber security defense-in-depth architecture by installation of [deterministic one-way devices], as described in Section 4.3, "Defense-In-Depth Protective Strategies" of the CSP.
- (d) Implement the management, operational and technical cyber security controls that address attacks promulgated by use of portable media, portable devices, and portable equipment as described in Appendix D Section 1.19 "Access Control for Portable and Mobile Devices," of Nuclear Energy Institute (NEI) 08-09, Revision 6.
- (e) Implement observation and identification of obvious cyber related tampering to existing insider mitigation rounds as described in Appendix E Section 4.3, "Personnel Performing Maintenance and Testing Activities," and Appendix E Section 10.3, "Baseline Configuration" of NEI 08-09, Revision 6.
- (f) Identify, document, and implement cyber security controls to physical security target set CDAs in accordance with Section 3.1.6, "Mitigation of Vulnerabilities and Application of Cyber Security Controls," of the CSP.
- (g) Ongoing monitoring and assessment activities will commence for those target set CDAs whose security controls have been implemented, as described in Section 4.4, "Ongoing Monitoring and Assessment," of the CSP.
- (h) Full implementation of the CSP for all safety, security, and emergency preparedness functions.

Provide a revised CSP implementation schedule that identifies the appropriate milestones, completion dates, supporting rationale, and level of detail to allow the NRC to evaluate the licensee's proposed schedule and associated milestone dates which include the final completion date. It is the NRC's intention to develop a license condition incorporating your revised CSP implementation schedule containing the key milestone dates.

### **RAI 3: Scope of Systems**

Paragraph 73.54(a) of 10 CFR requires licensees to provide high assurance that digital computer and communication systems and networks are adequately protected against cyber attacks, up to and including the design basis threat as described in 10 CFR 73.1. In addition,

10 CFR 73.54(a)(1) states that the licensee shall protect digital computer and communication systems and networks associated with:

- (i) Safety-related and important-to-safety functions;
- (ii) Security functions;
- (iii) Emergency preparedness functions, including offsite communications; and
- (iv) Support systems and equipment which, if compromised, would adversely impact safety, security, or emergency preparedness functions.

Subsequent to the issuance of the cyber security rule, the NRC stated that 10 CFR 73.54 should be interpreted to include structures, systems, and components (SSCs) in the balance of plant (BOP) that have a nexus to radiological health and safety (Agencywide Documents Access and Management System (ADAMS) Accession No. ML103490344, dated November 19, 2010). The SSCs in the BOP are those that could directly or indirectly affect reactivity of a nuclear power plant and could result in an unplanned reactor shutdown or transient and are therefore, within the scope of important-to-safety functions described in 10 CFR 73.54(a)(1). Furthermore, the NRC issued a letter to NEI dated January 5, 2011 (ADAMS Accession No. ML103550480) that provided licensees with additional guidance on one acceptable approach to comply with the Commission's policy determination.

Explain how the scoping of systems provided by licensee's CSP meets the requirements of 10 CFR 73.54 and the additional guidance provided by the NRC.

D. Heacock

- 2 -

The NRC staff considers that timely responses to requests for additional information help ensure that sufficient time is available for staff review and contribute toward the NRC's goal of efficient and effective use of staff resources. If circumstances result in the need to revise the requested response date, please contact me at (301) 415-3079.

Sincerely,

/RA/

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

Docket Nos. 50-305, 50-336, 50-423,  
50-338, 50-339, 50-280, and  
50-281

Enclosure: As stated

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RidsNrrLABTully Resource		RidsRgn3MailCenter Resource	RidsNRRPMSurry Resource

ADAMS Accession Number: ML110630359

\*via memo dated 2/18/11

OFFICE	LPL3-1/PM	LPL3-1/LA	NSIR/DSP/ISCPB/BC	LPL3-1/BC
NAME	KFeintuch	BTully	CErlanger*	RPascarelli
DATE	03/04/11	03/04/11	02/18/11	03/07/11

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Testimony before the  
CT General Assembly Energy & Technology Committee  
on  
Senate Bill-1176  
by  
Daniel A. Weekley  
March 15, 2011

Chairperson Nardello, Chairman Fonfara, Ranking members Witkos and Hoydick and other members of the Energy and Technology Committee: Thank you for providing time for the public to comment. I am Dan Weekley, vice president - Government Affairs and joining me today is James Martin, senior vice president - Regulatory Affairs at Dominion Resources. Dominion strongly opposes SB-1176.

As background, Dominion owns and operates the Waterford-based Millstone Power Station, as well as three (3) additional fossil-powered generating stations here in New England. The total generating capacity of all four (4) stations is roughly 4900 megawatts. In total, Dominion directly owns and operates more than 27,000 megawatts in the mid-Atlantic, Northeast and mid-Western portions of the United States.

**Millstone Background**

We purchased Millstone in 2001 through a state-sanctioned auction process. Dominion agreed to buy the facility and all associated property for approximately \$1.3 billion (\$1,300,000,000). As you may recall, due to the complexity of the sale, the transaction was reviewed by several state agencies, including the Department of Public Utility Control (DPUC), the Office of Consumer Counsel (OCC) and the Attorney General's (AG's) office.

As we have testified on many occasions, Dominion shareholders, not Connecticut ratepayers, have invested roughly \$600 million (\$600,000,000) in addition to the acquisition price in order to increase margins of safety, attain greater efficiency and improve reliability at Millstone. Particularly with respect to safety, our investments to date have exceeded the minimum requirements of regulations.



Thanks to our proven safety track record, we have offered technical assistance to the Japanese Government to help them with their ongoing nuclear emergency. Millstone Unit 1, which was permanently retired in 1997, is a similar design to the affected Japanese facility.

From an operational perspective, our investments are clearly working. The station is approximately 30% more reliable today than it was under the previous state-regulated jurisdiction. This increased output is roughly the equivalent of building an additional 650-megawatt power station. Millstone today is among the most reliable and important generating stations in New England. It is also both carbon and emissions free.

Finally, we are proud of the fact that we purchase approximately **\$200 million** of good and services annually from vendors based in Connecticut, and we are actively involved in the state through charitable and community giving. Most notably, last month we donated \$1million to Connecticut's Operation Fuel Fund for the development of a new job retention program.

#### **Senate Bill-1176**

Now let me turn to turn to SB-1176, specifically Section 1. This bill imposes a significant new punitive energy tax on CT baseload electricity generators. It calls for a \$.02 per kilowatt-hour tax on all electricity produced at Millstone along with varying tax rates on oil and coal-based generation.

The General Assembly and Governor Malloy have committed to reducing electricity prices for all consumer classes. SB-1176 will have the opposite effect -- without question it will result in a long term price increase for all consumers because the majority of energy supply in New England is sold via contracts, and all new costs, including this confiscatory tax, must and will be included in the contract price. Furthermore, the bill will reduce fuel diversity -- which has long been a goal of the State and this committee -- by increasing reliance on generation from natural gas. It is worth noting that other states have considered similar generation tax proposals and none have enacted them due to the likely adverse impact on ratepayers despite the fact that those proposals included much lower rates than those envisioned by SB-1176. Simply put, this bill will send a message across the country that Connecticut is closed for business.



### **Contracting**

According to ISO New England, the regional non-profit wholesale power entity, approximately 75% of all the power delivered in New England is via “bilateral contracts.” As the name suggests, bilateral contracts are entered into by a willing seller and willing buyer with fixed terms and conditions.

Examples of these types of bilateral contracts are the “Standard Offer” service provided by the state’s utilities. CL&P and UI procure power for electricity by means of state audited bids. In this type of full-service bid, the seller or provider of electricity to the utility must include all costs associated with the supply of electricity. Examples of costs include fuel, overhead, labor and benefits, risk, and of course, taxes. Utilities, as well as municipal and competitive electricity suppliers incorporate taxes into the bid price

Even though Dominion’s Millstone Power Station sells almost all of its output through longer term bilateral contracts, these contracts are constantly being negotiated. If SB-1176 were to move forward, Dominion, like any other responsible generator would have to include the costs of this confiscatory tax scheme in future supply contracts.

It should be further noted even though these contracts are “forward-looking” fixed price agreements; it is not uncommon to reopen the arrangements when the seller incurs a material change beyond its control. This punitive tax proposed in SB-1176 would constitute just such a material change.

### **Reliability and Fuel Diversity**

As I previously explained, Dominion has invested approximately \$600 million in safety and reliability improvements at Millstone, leading to a dramatic turnaround in performance at the station. The 30% improved reliability equates to approximately 650 megawatts of additional emissions-free generation -- a truly remarkable achievement.

Without question, safety will always be our highest priority. However, this type of punitive tax policy will plainly limit any further investment in reliability or expanded operations. The station currently employs 1200 people with an average yearly compensation of \$146,000 including salary and benefits. Expanding operations would mean more high paying jobs for Connecticut – a prospect made nearly impossible by this bill.



It is remarkable to think that the state would consider limiting investment in an existing emissions free and carbon free power station when we aspire to expand environmentally friendly generation. And let me be clear – other clean sources of energy are far more expensive than nuclear power. Moreover, unlike Millstone, which operates nearly around the clock providing baseload power, other emissions free options cannot always be counted on when they are needed the most.

### **Other State Taxation Policies**

No other state in the country has imposed any tax similar to the one contemplated by SB-1176. The federal government and a handful of other states, including Maryland, New York, New Hampshire, California, and Vermont have considered generator or other types of specific energy taxes as a way to reduce rates. All have come to the same conclusion: *No matter how well-intentioned, taxes on electricity immediately and directly harm the consumer.*

The New Hampshire legislature debated a generator tax just last year, although the tax rate in the New Hampshire proposal was substantially less than the one at issue here – just \$.0055 per kilowatt-hour. After much debate, legislators reached the obvious conclusion – the tax would raise -- not lower – rates, and the bill was defeated.

### **Fairness of Tax Policy**

In a just system of taxation, all taxpayers should be treated equally and fairly. SB-1176 fails that test. The bill discriminates among generation by different fuels and even goes so far as to tax some entities only during certain times of the year.

Connecticut is already considered one of the most anti-business states in the country. To his credit, Governor Malloy is seeking to change that reputation, proclaiming that “*CT is Open for Business.*” This legislation runs counter to that claim in several respects:

- First, it proposes a new tax that other states have already rejected
- Second, it disproportionately burdens one major business in an apparent attempt to help solve the state spending problem. Dominion will be required to pay more than \$300 million in additional taxes – not exactly



**Dominion™**

what Governor Malloy intended when he called upon businesses to  
*“share in the pain...”*

- Third, this tax will ultimately be passed onto the ratepayers
- And finally, this bill offers our citizens the false hope that that electricity rates will significantly decline in the near future.

### **Conclusion**

In summary, Dominion supports the goal of the General Assembly and the Governor to reduce energy prices. However, any type of “net generation” tax will have the opposite impact -- ultimately increasing prices without any intrinsic benefits.

**For these reasons, Dominion strongly opposes this bill, and Connecticut ratepayers should as well.**

Thank you again to all the members of the General Assembly for the opportunity to provide comments. We look forward to working with all parties on these and other issues in the future.



U.S. NUCLEAR REGULATORY COMMISSION  
REGION I  
NOTICE OF PUBLIC MEETING

May 5, 2011

Licensee: Dominion Nuclear Connecticut, Inc.

Facilities: Millstone Power Station

Docket Nos: 50-336 and 50-423

Date/ Time: May 25, 2011  
2:00 p.m. to 4:00 p.m.

Location: Waterford Town Hall  
15 Rope Ferry Road  
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 2010, as described in the annual assessment letter dated March 4, 2011. The NRC will respond to questions on specific performance issues at the plant and our role in ensuring safe plant operations.

NRC Attendees: J. Clifford, Deputy Director, Division of Reactor Projects  
D. Jackson, Chief, Division of Reactor Projects, Branch 5  
S. Shaffer, Senior Resident Inspector, Millstone  
B. Haagensen, Resident Inspector, Millstone  
J. Krafty, Resident Inspector, Millstone

Public Participation: This is a Category 3 Meeting. The public will have an opportunity to communicate with NRC staff following the presentation.

Meeting Contact: D. Jackson , Chief, Projects Branch 5  
610-337-5306  
E-mail: Donald.Jackson@nrc.gov

The NRC's annual assessment letter regarding Millstone Power Station performance during 2010 can be found in ADAMS with Accession Number ML110620174. ADAMS is accessible from the NRC website at: <http://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,

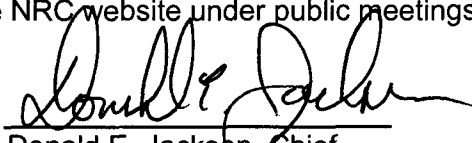
<http://www.nrc.gov/reading-rm/doc-collections/commission/policy/67fr36920.html>, and contains information regarding visitors and security.

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 May 15, 2011 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:



Donald E. Jackson, Chief  
Projects Branch 5  
Division of Reactor Projects

cc: Distribution via ListServ

<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 May 15, 2011, 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: IRA  
Donald E. Jackson, Chief  
Projects Branch 5  
Division of Reactor Projects

Distribution: (via email)

W. Dean, RA

D. Lew, DRA

D. Roberts, DRP

J. Clifford, DRP

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**Agenda**

**NRC's Annual Assessment Meeting**

**Millstone Power Station**

**May 25, 2011  
2:00 p.m. to 4:00 p.m.**

**Waterford Town Hall  
15 Rope Ferry Road  
Waterford, CT 06385**

**Formal Meeting**

Introduction

Discussion of Millstone Power Station performance in 2010 ..... (10 minutes)

Discussion of U.S. plant safe operation in light of Japan event ..... (10 minutes)

NRC to address public questions ..... (as needed)

Closing Remarks ..... (5 minutes)

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I  
NOTICE OF PUBLIC MEETING

May 5, 2011

Licensee: Dominion Nuclear Connecticut, Inc.

Facilities: Millstone Power Station

Docket Nos: 50-336 and 50-423

Date/ Time: May 25, 2011  
6:30 p.m. to 8:30 p.m.

Location: Waterford Town Hall  
15 Rope Ferry Road  
Waterford, CT 06385

Purpose: To discuss NRC's assessment of the safety performance of the Millstone Power Station for calendar year 2010 with the Nuclear Energy Advisory Council (NEAC).

NRC Attendees: J. Clifford, Deputy Director, Division of Reactor Projects  
D. Jackson, Chief, Division of Reactor Projects, Branch 5  
S. Shaffer, Senior Resident Inspector, Millstone  
B. Haagensen, Resident Inspector, Millstone  
J. Krafty, Resident Inspector, Millstone

NEAC Attendees: W. Sheehan, Chairman  
Quorum of NEAC Committee Membership

Public Participation: This is a Category 3 Meeting. The public will have an opportunity to communicate with NRC staff following the presentation.

Meeting Contact: Donald E. Jackson, Chief, Projects Branch 5  
610-337-5306  
E-mail: [Donald.Jackson@nrc.gov](mailto:Donald.Jackson@nrc.gov)

The NRC's annual assessment letter regarding Millstone Power Station performance during 2010 can be found in ADAMS with Accession Number ML110620174. ADAMS is accessible from the NRC website at: <http://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,

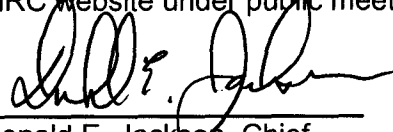
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The NRC provides reasonable accommodation to individuals with disabilities where appropriate. If you need a reasonable accommodation to participate in this meeting, or need the meeting notice or other information from the meeting in another format (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 May 15, 2011 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:

  
\_\_\_\_\_  
Donald E. Jackson, Chief  
Projects Branch 5  
Division of Reactor Projects

cc: Distribution via ListServ

<http://www.nrc.gov/reading-rm/doc-collections/commission/policy/67fr36920.html>, and contains information regarding visitors and security.

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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: IRA  
 Donald E. Jackson, Chief  
 Projects Branch 5  
 Division of Reactor Projects

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**Agenda**

**NRC & NEAC Meeting  
Concerning Millstone Power Station Performance**

**May 25, 2011  
6:30 p.m. to 8:30 p.m.**

**Waterford Town Hall  
15 Rope Ferry Road  
Waterford, CT 06385**

**Formal Meeting**

Introduction

Discussion of Millstone Power Station Performance in 2010.....NRC (10 minutes)

Discussion of U.S. plant safe operation in light of Japan event .....NRC (10 minutes)

NEAC's Response and Questions ..... NEAC (as needed)

NRC to address public questions.....NRC/Members of the Public (as needed)

Closing Remarks ..... NRC (5 minutes)





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

May 9, 2011

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  
05000336/2011002 AND 05000423/2011002

Dear Mr. Heacock:

On March 31, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Millstone Power Station Unit 2 and Unit 3. The enclosed inspection report documents the inspection results, which were discussed on April 20, 2011, with Mr. A. J. Jordan 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.

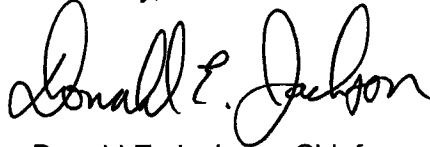
This report documents two self-revealing findings of very low safety significance (Green). Both of these findings were determined to involve violations of NRC requirements. However, because of the very low safety significance and because they have been entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs) consistent with Section 2.3.2.a of the NRC Enforcement Policy. If you contest any NCV, 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. 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. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

D. Heacock

2

In accordance with Title 10 of the Code of Federal Regulations (CFR) Part 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 Web Site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

A handwritten signature in black ink that reads "Donald E. Jackson". The signature is written in a cursive style with a large initial "D" and "J".

Donald E. Jackson, Chief  
Projects Branch 5  
Division of Reactor Projects

Docket Nos. 50-336, 50-423

License Nos. DPR-65, NPF-49

Enclosure: Inspection Report No. 05000336/2011002 and 05000423/2011002  
w/Attachment: Supplemental Information

cc w/encl: Distribution via Listserv

D. Heacock

2

In accordance with Title 10 of the Code of Federal Regulations (CFR) Part 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 Web Site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Donald E. Jackson, Chief  
Projects Branch 5  
Division of Reactor Projects

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

Enclosure: Inspection Report No. 05000336/2011002 and 05000423/2011002  
w/Attachment: Supplemental Information

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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.: 05000336/2011002 and 05000423/2011002

Licensee: Dominion Nuclear Connecticut, Inc.

Facility: Millstone Power Station, Units 2 and 3

Location: P. O. Box 128  
Waterford, CT 06385

Dates: January 1, 2011 through March 31, 2011

Inspectors: S. Shaffer, Senior Resident Inspector, Division of Reactor Projects (DRP)  
J. Krafty, Resident Inspector, DRP  
B. Haagensen, Resident Inspector, DRP  
T. Moslak, Health Physicist, Division of Reactor Safety (DRS)  
P. Presby, Senior License Examiner, DRS  
W. Schmidt, Senior Reactor Analyst, DRS

Approved by: Donald E. Jackson, Chief  
Projects Branch 5  
Division of Reactor Projects

Enclosure

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## SUMMARY OF FINDINGS

IR 05000336/2011002, 05000423/2011002; 01/01/2011 – 03/31/2011; Millstone Power Station Unit 2 and Unit 3; Flood Protection Measures, Post-Maintenance Testing.

This report covered a three-month period of inspection by resident and region-based inspectors. Two Green self-revealing findings, both of which were non-cited violations (NCVs), were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process." The cross-cutting aspects were determined using IMC 0310, "Components Within the Cross Cutting Areas." Findings for which the significance determination process (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. A self-revealing Green non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified for Dominion's failure to maintain safety related cables in an environment for which they were designed. Specifically, 480V safety related cables, which are not qualified for continuous submergence, were found submerged in a cable vault since approximately October 20, 2010, to March 14, 2011. Dominion took immediate corrective action to remove the water from the cable vault and entered the issue into their corrective action program (CAP).

The inspectors determined that the finding was more than minor because if left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern. Specifically, the inspectors noted that the insulation of continuously submerged cables would degrade more than dry or periodically wetted cables, which would lead to failures. The finding was of very low safety significance (Green) because the finding was not a design or qualification deficiency which resulted in a loss of operability or functionality, did not represent a loss of system safety function, did not represent an actual loss of safety function of a single train for greater than its Technical Specification allowed outage time, did not represent an actual loss of safety function of one or more non-Technical Specification trains of equipment designated as risk-significant for greater than 24 hours, and was not potentially risk significant due to a seismic, flooding or severe weather initiating event. The inspectors determined that the finding had a cross-cutting aspect in the Problem Identification and Resolution cross-cutting area, Operating Experience component, because Dominion did not effectively implement Operating Experience to prevent submergence of safety related cables. [P.2(b)] (Section 1R06)

- Green. A self-revealing Green NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified for Dominion's failure to properly restore 3HVQ\*ACUS2B, "Containment Recirculation Pumps and Coolers Area 'B' Air Conditioning Unit," following maintenance. This resulted in approximately an

Enclosure

additional 24 hours of inoperability of the 'B' train of the recirculation spray system (RSS). Dominion entered the issue into their corrective action program.

The inspectors determined that the finding was more than minor because it was associated with the Human Performance attribute of the Mitigating Systems cornerstone, and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, Dominion's failure to follow the written instructions in the tagging cover sheet caused the 'B' train of RSS to be inoperable for approximately an additional 24 hours. Using IMC 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the inspectors determined that the finding was of very low safety significance (Green) because the finding did not represent a loss of system safety function, did not represent an actual loss of safety function of a single train for greater than its Technical Specification allowed outage time, did not represent an actual loss of safety function of one or more non-Technical Specification trains of equipment designated as risk-significant for greater than 24 hours, and was not potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors determined that the finding had a cross-cutting aspect in the Human Performance cross-cutting area, Work Practices component, because operations personnel did not follow the instructions on the tagging cover sheet when returning the air conditioning unit to service. [H.4(b)] (Section 1R19)

## REPORT DETAILS

### Summary of Plant Status

Millstone Unit 2 and Unit 3 began the inspection period operating at 100 percent power. With the exception of minor downpowers for turbine valve testing, both Unit 2 and Unit 3 operated at or near 100 percent power for the inspection period.

#### 1. REACTOR SAFETY

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

#### 1R01 Adverse Weather Protection (71111.01 - 1 sample)

##### Impending Adverse Weather

##### a. Inspection Scope

The inspectors evaluated Dominion's preparations for heavy snowfall on January 12, 2011. The inspectors reviewed Dominion's procedures to determine the plant areas most likely to be affected by the heavy snowfall and verified that actions recommended by the procedures were in progress or complete. The inspectors spoke with supervision in several departments and determined that snow removal equipment was available, additional personnel were being scheduled into the site, and that fatigue restrictions were considered in their planning. The inspectors also walked down the site in order to verify that the heavy snowfall would not impact any essential plant equipment. Documents reviewed during the inspection are listed in the Attachment.

##### b. Findings

No findings were identified.

#### 1R04 Equipment Alignment (71111.04 - 5 samples)

##### .1 Partial System Walkdowns

##### a. Inspection Scope

The inspectors performed five partial system walkdowns during this inspection period. The inspectors reviewed the documents listed in the Attachment to determine the correct system alignment. The inspectors performed a walkdown of each system to determine if the critical portions of the selected systems were correctly aligned in accordance with the procedures, and to identify any discrepancies that may have had an effect on operability. The walkdowns included selected switch and valve position checks, and verification of electrical power to critical components. Finally, the inspectors evaluated

Enclosure



other elements, such as material condition, housekeeping, and component labeling. The following systems were reviewed based on their risk significance for the given plant configuration:

Unit 2

- 'B' High Pressure Safety Injection (HPSI) while the 'A' HPSI was out-of-service (OOS) for surveillance testing on January 25, 2011;
- 'A' Emergency Diesel Generator (EDG) while the 'B' EDG was OOS for surveillance testing on February 2, 2011;

Unit 3

- Charging system following in-service testing (IST) of the 'C' charging pump on January 10, 2011;
- 'B' EDG during monthly maintenance on the 'A' EDG on January 25, 2011; and
- 'B' Service Water (SW) train while the 'A' SW pump was OOS for repairs on February 24, 2011.

b. Findings

No findings were identified.

.2 Complete System Walkdown (71111.04S -1 sample)

a. Inspection Scope

The inspectors completed a detailed review of the alignment and condition of the Unit 2 Containment Spray System. The inspectors performed a walkdown of the system to determine whether the valves were aligned in accordance with procedures and to identify any discrepancies that may have had an adverse effect on operability. The inspectors also reviewed the system health reports, condition reports (CR), and maintenance rule evaluations to determine whether equipment problems were being identified and appropriately resolved. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05Q –7 samples).1 Fire Protection-Toursa. Inspection Scope

The inspectors performed walkdowns of seven fire protection areas. The inspectors reviewed Dominion's fire protection program to determine the required fire protection design features, fire area boundaries, and combustible loading requirements for the selected areas. The inspectors walked down these areas to assess Dominion's control of transient combustible material and ignition sources. In addition, the inspectors evaluated the material condition and operational status of fire detection and suppression capabilities, fire barriers, and any related compensatory measures. The inspectors compared the existing conditions of the areas to the fire protection program requirements to determine if all program requirements were being met. Documents reviewed during the inspection are listed in the Attachment. The fire protection areas reviewed included:

Unit 2

- Auxiliary Building General Area, Sample Sink and Boronmeter Room, Fire Area A-12;
- 480 Volt MCC B61, Fire Area A-13;
- Auxiliary Building, Spent Fuel Pool and Fuel Handling Area, Fire Area A-14;
- Auxiliary Building, HPSI Pump room, Fire Area A-4;
- Auxiliary building, Coolant Tank Area, Fire Area A-5;

Unit 3

- East Service Water Cubicle, Fire Area CSW-3; and
- West Service Water Cubicle, Fire Area CSW-4.

b. Findings

No findings were identified.

.2 Annual Fire Drill Observation (71111.05A – 1 sample)a. Inspection Scope

The inspectors observed Dominion personnel performance during a fire brigade drill on March 11, 2011, to evaluate the readiness of station personnel to fight fires. The drill simulated a fire in a motor control center (MCC) in the Unit 3 turbine building. The inspectors observed the fire brigade members using protective clothing, turnout gear, self-contained breathing apparatus and entering the fire area. The inspectors also observed the fire fighting equipment brought to the fire scene to evaluate whether sufficient equipment was available to effectively control and extinguish the simulated fire.

Enclosure

The inspectors evaluated whether the permanent plant fire hose lines were capable of reaching the fire area and whether hose usage was adequately simulated. The inspectors observed the fire fighting directions and communications between fire brigade members. The inspectors also evaluated whether the pre-planned drill scenario was followed and observed the post drill critique to evaluate if the drill objectives were satisfied and that any drill weaknesses were discussed.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 2 samples)

.1 Internal Flooding

a. Inspection Scope

The inspectors reviewed the flood protection measures for equipment in the Unit 2 Motor Driven Auxiliary Feedwater Pump Room. The inspectors evaluated Dominion's protection of safety-related systems from internal flooding conditions. The inspectors performed a walkdown of the area, interviewed the system engineer, reviewed the internal flooding evaluation, and verified that preventive maintenance was being performed on critical flood protection detection equipment to ensure that equipment and conditions remained consistent with those indicated in the design basis and flooding evaluation documents. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings were identified.

.2 Inspection of Cable Vaults

a. Inspection Scope

The inspectors inspected 3EMH\*3A and 3EMH\*3B underground cable vaults in order to determine if the safety related cables contained in the vaults were submerged in water. The inspectors also observed the condition of the cables, cable splices, cable support structures, and general condition of the vault to verify that there had not been significant degradation. The inspectors discussed the results with the system engineer.

b. Findings

Introduction: A self-revealing Green NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified for Dominion's failure to maintain safety related cables in an environment for which they were designed. Specifically, 480V safety related cables,

which are not qualified for continuous submergence, were submerged in a cable vault for an undetermined length of time.

Description: On March 14, 2011, Dominion opened up manhole 3EMH\*3B for inspection. 3EMH\*3B contains safety related and non-safety related cables for the Unit 3 'A' Engineered Safety Feature (ESF) building components. Upon opening the manhole, Dominion discovered that there was approximately four feet of water in the vault. After inspecting the vault and reviewing drawings, Dominion determined that the 480V safety related cables for fan 3HVQ\*FN5A and MCC 32-4T had been submerged for an undetermined length of time. MCC 32-4T loads include several safety related motor operated valves (MOV) for Emergency Core Cooling Systems (ECCS). According to SP-M3-EE-353, "Millstone Unit 3 Equipment Qualification Record," the cables are not qualified for submergence. A review of maintenance history revealed that 3EMH\*3B was last inspected on October 20, 2010. Dominion performed an operability review and determined that the equipment supplied from these cables was operable, based on visual inspection of the cables, and recent operation of equipment serviced by the cables.

Analysis: The inspectors determined that Dominion's failure to maintain safety related cables in an environment for which they were designed was a performance deficiency. 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. A review of IMC 0612, Appendix E, "Examples of Minor Issues," revealed that the performance deficiency was not similar to any of the examples. The inspectors determined that the finding was more than minor because if left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern. Specifically, the inspectors noted that the insulation of continuously submerged cables would degrade more than dry or periodically wetted cables, which would lead to failures.

Using IMC 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the inspectors determined that the finding was of very low safety significance (Green) because the finding was not a design or qualification deficiency which resulted in a loss of operability or functionality, did not represent a loss of system safety function, did not represent an actual loss of safety function of a single train for greater than its Technical Specification allowed outage time, did not represent an actual loss of safety function of one or more non-Technical Specification trains of equipment designated as risk-significant for greater than 24 hours, and was not potentially risk significant due to a seismic, flooding, or severe weather initiating event.

The inspectors determined that the finding had a cross-cutting aspect in the Problem Identification and Resolution cross-cutting area, Operating Experience component, because Dominion did not effectively implement Operating Experience to prevent submergence of safety related cables. [P.2(b)]

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**Enforcement:** 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures shall be established to ensure that applicable regulatory requirements and design bases are correctly translated into specifications, drawings, procedures, and instructions. Contrary to the above, from approximately October 20, 2010, to March 14, 2011, Dominion failed to maintain the safety-related cables in cable vault 3EMH\*3B in an environment for which they were designed. Dominion took immediate corrective actions to remove the water from the cable vault. Because this violation was of very low safety significance (Green), and has been entered into Dominion's corrective action program (CR417729), this violation is being treated as an NCV, consistent with the NRC Enforcement Policy. **(NCV 05000423/2011002-01, Failure to Prevent Safety Related Cables from Being Submerged)**

1R07 Heat Sink Performance (71111.7A – 1 sample)

a. Inspection Scope

The inspectors observed the as-found condition of the 'A' EDG heat exchangers after they were opened to verify that any adverse fouling concerns were appropriately addressed. The inspectors reviewed the results of the inspections against the acceptance criteria contained within the procedure to determine whether all acceptance criteria had been satisfied. The inspectors also reviewed the Generic Letter 89-13 responses to ensure that heat exchanger inspection results were consistent with the responses. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings were identified.

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

Resident Inspector Quarterly Review (71111.11Q)

a. Inspection Scope

The inspectors observed simulator-based licensed operator requalification training for Unit 2 and Unit 3 on January 19, 2011. The inspectors evaluated crew performance in the areas of clarity and formality of communications; ability to take timely actions; prioritization, interpretation, and verification of alarms; procedure use; control board manipulations; oversight and direction from supervisors; and command and control. Crew performance in these areas was compared to Dominion management expectations and guidelines as presented in Dominion procedure OP-MP-100-1000, "Millstone Operations Guidance and Reference Document." The inspectors compared simulator configurations with actual control board configurations. The inspectors also observed Dominion evaluators discuss identified weaknesses with the crew and/or individual crew members, as appropriate. Documents reviewed during the inspection are listed in the Attachment.

Enclosure

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 5 samples)a. Inspection Scope

The inspectors reviewed five samples of Dominion's evaluation of degraded conditions, involving safety-related structures, systems and/or components for maintenance effectiveness during this inspection period. The inspectors reviewed Dominion's implementation of the "Maintenance Rule," 10 CFR 50.65. The inspectors reviewed Dominion's ability to identify and address common cause failures, the applicable Maintenance Rule scoping document for each system, the current classification of these systems in accordance with 10 CFR 50.65 (a)(1) or (a)(2), and the adequacy of the performance criteria and goals established for each system, as appropriate. The inspectors also reviewed recent system health reports, CRs, apparent cause determinations, functional failure determinations, operating logs, and discussed system performance with the responsible system engineer. Documents reviewed during the inspection are listed in the Attachment.

The specific systems/components reviewed were:

Unit 2

- Pressurizer;
- 120 Volt Non Vital Regulated Alternating Current (AC) Power;
- 480 Volt AC Motor Control Center;

Unit 3

- Main Steam; and
- Service Water.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 6 samples)a. Inspection Scope

The inspectors evaluated online risk management for emergent and planned activities. The inspectors reviewed maintenance risk evaluations, work schedules, and control room logs to determine if concurrent planned and emergent maintenance or surveillance activities adversely affected the plant risk already incurred with OOS components. The inspectors evaluated whether Dominion took the necessary steps to control work activities, minimize the probability of initiating events, and maintain the functional capability of mitigating systems. The inspectors assessed Dominion's risk management actions during plant walkdowns. Documents reviewed during the inspection are listed in the Attachment. The inspectors reviewed the conduct and adequacy of risk assessments for the following maintenance and testing activities:

Unit 2

- Yellow Risk for 'B' HPSI Pump IST Surveillance on January 25, 2011;
- Yellow Risk for Facility 1 Emergency Core Cooling System (ECCS) Suction Line Leak Test on January 26, 2011;
- Yellow Risk for inoperable 'B' EDG with 'A' EDG running to verify no common cause failure on March 31, 2011;

Unit 3

- Emergent risk assessment for 'A' condenser backflush during the 'C' circulating water bay outage with the 'C' SW pump OOS on January 19, 2011;
- Emergent work to repair Supplementary Leak Collection and Release System (SLCRS) boundary on February 11, 2011; and
- Emergent risk assessment (Yellow) due to failure of 3HVQ\*ACUS2B while restoring relief valve CCP\*RV59B with 'B' Engineered Safety Feature (ESF) OOS on March 3, 2011.

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15 – 5 samples)a. Inspection Scope

The inspectors reviewed five operability determinations (OD). The inspectors evaluated the ODs against the guidance contained in NRC Regulatory Issue Summary 2005-20, Revision to Guidance Formerly Contained in NRC Generic Letter 91-18, "Information to Licensees Regarding Two NRC Inspection Manual Sections on Resolution of Degraded and Nonconforming Conditions and on Operability." The inspectors also discussed the conditions with operators and system and design engineers, as necessary. Documents

reviewed during the inspection are listed in the Attachment. The inspectors reviewed the adequacy of the following evaluations of degraded or non-conforming conditions:

Unit 2

- CR411667, Water Drained from Facility 1 ECCS Encapsulation Drain More than Normal;
- CR411479, Feedwater Temperature Indication TE-5318 Erratic which challenged the operability of the calorimetric calculation;
- CR413310, Engineered Safety-Feature Actuation System (ESAS) Channel 'D' Bistable BA409 potentiometer locking mechanism not functioning;
- CR416871, Operability and Maintenance Rule questions on Unit 2 ECCS gas surveillance; and

Unit 3

- IOD 000170 written to address the concern in CR415000 which covered the installation of incorrect parts in the 'B', 'C', and 'D' SW strainers.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 1 sample)

a. Inspection Scope

The inspectors assessed the adequacy of DM2-00-0001-11, "Design Change Required to Remove Failed Facility 2 Proportional Heater," Revision 11, which is a temporary modification. The inspectors walked down the system and components, interviewed plant staff, and reviewed applicable documents, including procedures, calculations, modification packages, engineering evaluations, drawings, corrective action program documents, the Updated Final Safety Analysis Report (UFSAR), and Technical Specifications (TS).

For the modification reviewed, the inspectors determined whether selected attributes (component safety classification, energy requirements supplied by supporting systems, seismic qualification, instrument setpoints, uncertainty calculations, electrical coordination, electrical loads analysis, and equipment environmental qualification) were consistent with the design and licensing bases. Design assumptions were reviewed to verify that they were technically appropriate and consistent with the UFSAR. For each modification, the 10 CFR 50.59 screenings or safety evaluations were reviewed. The inspectors also verified that procedures, calculations, and the UFSAR were properly updated with revised design information. In addition, the inspectors verified that the as-built configuration was accurately reflected in the design documentation and that post-modification testing was adequate to ensure the structures, systems, and components

Enclosure



would function properly. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 8 samples)

a. Inspection Scope

The inspectors reviewed eight post-maintenance test (PMT) activities to determine whether the PMT adequately demonstrated that the safety-related function of the equipment was satisfied, given the scope of the work specified, and that operability of the system was restored. In addition, the inspectors evaluated the applicable test acceptance criteria to evaluate consistency with the associated design and licensing bases, as well as TS requirements. The inspectors also evaluated whether conditions adverse to quality were entered into the corrective action program for resolution. Documents reviewed during the inspection are listed in the Attachment. The following maintenance activities and PMTs were evaluated:

Unit 2

- OP 2345B, "120 Volt Vital Instrument AC System," Revision 017-02 following Replacement of the Capacitors on Inverter 6 on January 5, 2011;
- SP 2612B-003, "'C' SW Pump and Facility 2 Discharge Check Valve IST," Revision 002-08 and SP 2612B-005, "'C' SW Pump Comprehensive Pump Test," Revision 000 following 'C' SW strainer overhaul on February 12, 2011;
- SP 2613L, "Periodic EDG Slow Start Operability Test, Facility 2 (Loaded Run)," Revision 004-08 and SP 2624B, "'B' EDG Starting Air Vent Valve IST," Revision 002-05 following replacement of starting air valves and differential relay calibrations on the 'B' EDG on March 2, 2011;

Unit 3

- SP 3626.3, "SW Valve Operability Tests," Revision 010-08, following maintenance on 3SWP\*MOV57A and 3SWP\*MOV57C on January 19, 2011;
- SP 3626.6, "SW Pump 3SWP\*P1C Comprehensive Test," Revision 0-01, following refurbishment of the 'C' SW pump on January 29, 2011;
- SP 3608.2, "Safety Injection Pump 'B' Quarterly IST Pump Test," Revision 010, following maintenance on the 'B' SIH pump on February 25, 2011;
- EN 31096 PMT following restoration of 3HVQ\*ACUS2B following planned maintenance on March 2, 2011; and
- WO530112601973/CR415773 following maintenance on 3HVC\*ACU1B on March 3, 2011.

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b. Findings

Introduction: A self-revealing Green NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified for Dominion's failure to properly restore 3HVQ\*ACUS2B, "Containment Recirculation Pumps and Coolers Area 'B' Air Conditioning Unit," following maintenance. This resulted in an additional 24 hours of inoperability of the 'B' train of the RSS.

Description: On March 2, 2011, at 3:46 a.m., Unit 3 removed 3HVQ\*ACUS2B from service for planned maintenance. Technical Specifications limiting condition for operations (LCO) 3.5.2 and 3.6.2.2 were entered. The equipment was returned to service and the TSs were exited that afternoon at 1:50 p.m. On March 3, 2011, at 10:07 a.m., 3HVQ\*ACUS2B failed to start. Dominion entered unplanned LCO actions TS 3.5.2 and 3.6.2.2. An initial investigation determined that the compressor low oil pressure switch (3HVQ\*PDS1022B) was tripped and had not been reset following the calibration of the switch the previous day. The switch was reset, the air conditioning run was successful, and the TS LCOs were exited at 1:35 p.m.

Further investigation determined that operations personnel did not properly align the air conditioning unit for automatic operation as specified in the tagging cover sheet for the switch calibration. An interview with the I&C technician revealed that he did not realize that the switch was tripped following the calibration.

Analysis: The inspectors determined that Dominion's failure to follow the instructions on the tagging cover sheet for restoration of 3HVQ\*ACUS2B was a performance deficiency. 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 determined that the finding was more than minor because it was associated with the Human Performance attribute of the Mitigating Systems cornerstone, and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, Dominion's failure to follow the written instructions in the tagging cover sheet caused the 'B' train of RSS to be inoperable for approximately an additional 24 hours.

Using IMC 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the inspectors determined that the finding was of very low safety significance (Green) because the finding did not represent a loss of system safety function, did not represent an actual loss of safety function of a single train for greater than its Technical Specification allowed outage time, did not represent an actual loss of safety function of one or more non-Technical Specification trains of equipment designated as risk-significant for greater than 24 hours, and was not potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors determined that the finding had a cross-cutting aspect in the Human Performance cross-cutting area, Work Practices component, because operations personnel did not follow the instructions on the tagging cover sheet when returning the air conditioning unit to service. [H.4(b)]

**Enforcement:** 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances, and shall be accomplished in accordance with these instructions, procedures, or drawings. Contrary to the above, Dominion did not accomplish the task in accordance with instructions on the tagging cover sheet when returning the air conditioning unit to service from March 2, 2011, at 1:50 p.m. until March 3, 2011, at 1:35 p.m., which resulted in the 'B' train of RSS being inoperable for approximately an additional 24 hours. Because this violation was of very low safety significance (Green), and has been entered into Dominion's corrective action program (CR415899, CR415954, CR417419), this violation is being treated as an NCV, consistent with the NRC Enforcement Policy. **(NCV 05000423/2011002-02, Improper Restoration of Air Conditioning Equipment Following Maintenance Results in Inoperability of 'B' Train of Recirculation Spray System**

1R22 Surveillance Testing (71111.22 – 7 samples)

a. Inspection Scope

The inspectors reviewed seven surveillance activities to determine whether the testing adequately demonstrated equipment operational readiness and the ability to perform the intended safety-related function. The inspectors attended pre-job briefings, reviewed selected prerequisites and precautions to determine if they were met, and observed the tests to determine whether they were performed in accordance with the procedural steps. Additionally, the inspectors reviewed the applicable test acceptance criteria to evaluate consistency with associated design bases, licensing bases, and TS requirements and that the applicable acceptance criteria were satisfied. The inspectors also evaluated whether conditions adverse to quality were entered into the corrective action program for resolution. Documents reviewed during the inspection are listed in the Attachment. The following surveillance activities were evaluated:

Unit 2

- CP 2802N, "Primary Coolant Sampling and Analysis," Revision 000-03;
- OP 2602A, "Reactor Coolant Leakage," Revision 006-01;
- SP 2611B, "'C' RBCCW Pump Tests," Revision 009;
- SP 2605W, "Leak Testing of Containment Sump Header Piping, Facility 1 and Facility 2," Revision 000-02;

Unit 3

- 3CHS\*P3C, Charging Pump quarterly IST on January 11, 2011;
- SP 3646A.13, EDG 'B' Lockout Test," Revision 01 on February 8, 2011; and
- SP 3601F.6, "Reactor Coolant System Water Inventory Measurement," Revision 006-03.

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 February 28, 2011, through March 3, 2011, the inspectors conducted the following activities to verify that Dominion was evaluating, monitoring, and controlling radiological hazards for work performed in locked high radiation areas (LHRA) and other radiological controlled areas. The inspectors also confirmed that workers were adhering to these controls when working in these areas. Implementation of these controls was reviewed against the criteria contained in 10 CFR 20, TS, and with Dominion's procedures.

Radiological Hazards Control and Work Coverage

The inspectors identified recent work performed in radiological controlled areas in Unit 2 and Unit 3 and evaluated Dominion's assessment of the radiological hazards. The inspectors reviewed exposure control evaluations and radiation work permits (RWP) associated with these areas to determine if the associated controls were acceptable. Specific work activities evaluated included the troubleshooting, planning, and repair of valve 2-FW-261B (AEs 2-10-03/04/05 respectively), and replacement of the Unit 3 'C' charging pump rotating assembly (AE3-10-16).

Additionally the inspectors reviewed the Radiation Work Permits (RWP) developed for work to be performed during 2011, including the Spring Unit 2 (2R20) refueling outage. The inspectors reviewed the electronic dosimeter dose/dose rate alarm set points stated on the RWP to determine if the set points were consistent with the survey indications and plant policy.

Problem Identification and Resolution

A review of Nuclear Oversight field observation reports, dose/dose rate alarm reports, personnel contamination event reports and associated CRs, was performed to determine if identified problems and negative performance trends were entered into the corrective action program and evaluated for resolution and to determine if an observable pattern traceable to a similar cause was evident.

Relevant CR's, associated with radiation protection control access initiated November 2010 through January 2011, were reviewed and discussed with Dominion staff to determine if the follow up activities were being performed in an effective and timely manner, commensurate with their safety significance.

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b. Findings

No findings were identified.

2RS02 Occupational ALARA Planning and Controls (71124.02)

a. Inspection Scope

During the period February 28, 2011, through March 3, 2011, the inspectors conducted the following activities to verify that Dominion was properly implementing operational, engineering, and administrative controls to maintain personnel exposure as low as reasonably achievable (ALARA) in making preparations for the spring refueling outage (2R20).

Implementation of this program was reviewed against the criteria contained in 10 CFR 20, applicable industry standards and with Dominion's procedures.

Radiological Work Planning

The inspectors reviewed the preparations being made for performing radiological significant tasks during the spring 2011 Unit 2 refueling outage (2R20). Included in this review was the ALARA Plans (AP) for all of the jobs whose dose was estimated to exceed 5 person rem. These jobs included reactor vessel disassembly/re-assembly (AP 2-11-01), steam generator (SG) corrective & preventative maintenance activities (AP 2-11-09), scaffolding installation/removal (AP 2-11-13), 'C' reactor coolant pump motor/seal replacement (AP 2-11-16), and radiation protection support activities (AP 2-11-26).

In performing this review, the inspectors evaluated contamination control measures, use of portable ventilation systems, use of temporary shielding, and the control of system drain-downs. Additionally, the inspectors evaluated the departmental interfaces between radiation protection, operations, maintenance crafts, and engineering to identify missing ALARA program elements and potential interface problems. The evaluation was accomplished by reviewing recent ALARA Committee meeting minutes, Nuclear Oversight Reports, and interviewing the site Radiation Protection Manager and the ALARA Supervisor regarding the spring 2R20 preparations.

Problem Identification and Resolution

The inspectors reviewed CR, Nuclear Oversight field observations, and ALARA Committee meeting minutes to evaluate the threshold for which ALARA related issues are entered into the corrective action program, the comprehensiveness of the cause evaluation, and the effectiveness of the corrective actions.

b. Findings

No findings were identified.

2RS03 In-Plant Airborne Radioactivity Control and Mitigation (71124.03)a. Inspection Scope

During the period February 28, 2011, through March 3, 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 maintained and used by qualified personnel.

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

Engineering Controls

The inspectors verified that Dominion uses installed ventilation systems as part of its engineering controls (in lieu of respiratory protection devices) to control airborne radioactivity. The inspectors reviewed procedural guidance for use of an installed system, the Unit 2 Control Room emergency ventilation system, also known as the Control Room Air Conditioning System (CRACS), and determined that the system was operable. The inspectors reviewed surveillance testing procedures and related data to confirm that the airflow capacity, flow path, and charcoal/HEPA filter efficiencies met TS operating criteria and are consistent with maintaining concentrations of airborne radioactivity as low as practicable. Also reviewed were the radiation detector calibration records for installed monitors (9799 A/B) and testing records that the system realigned at the appropriate radiation level. The inspectors reviewed the CRACS system health report and CR to evaluate current operating status. With the assistance of the plant system engineer, the inspectors verified the system configuration by walking down components.

The inspectors evaluated the use of portable continuous air monitors (AMS-4) and portable HEPA ventilation systems that are used during refueling outages, at work locations where airborne contamination may occur. The inspectors reviewed the calibration records for AMS-4 monitors to determine if the instruments were operable and that their alarm set points were appropriately established. The inspectors reviewed testing records for portable HEPA ventilation systems to determine that procedural requirements were met.

Through review of relevant procedures and analytical data, the inspectors determined that Dominion has established an alpha and transuranic monitoring program. Included in this program were trigger levels for conducting additional measurements to assure that the airborne concentrations were properly characterized and that bioassay measurements would be taken should the monitoring threshold be reached.

### Use of Respiratory Protection Devices

The inspectors observed the respirator fit testing on one individual to determine if the testing was appropriately conducted per the procedural guidance. Additionally, the inspectors confirmed that the individual tested had completed the requisite training and was medically qualified to wear a respirator.

The inspectors examined various negative pressure and self-contained respiratory protection devices and determined that these devices were certified for use by the National Institute for Occupational Safety and Health/Mine Safety and Health Administration (NIOSH/MSHA).

### Self-Contained Breathing Apparatus for Emergency Use

The inspectors evaluated the adequacy of the respiratory protection program regarding the maintenance and issuance of self-contained breathing apparatus (SCBA) to emergency response personnel. Training and qualification records were reviewed for at least three licensed operators from each of the operating shifts, and for selected radiation protection personnel who would wear SCBAs in the event of an emergency.

The inspectors observed a technician perform functional inspections on five randomly selected SCBA staged in the Unit 2 and Unit 3 control rooms. Maintenance, flow alarm tests, and regulator flow test records for these SCBA were reviewed. Air sample results were reviewed to confirm that the tank air quality met CGA G-7.1, Grade D (2004) standards. Through review of training lesson plans and interviews, the inspectors confirmed that individuals qualified to wear SCBA were trained in replacing spent air cylinders.

### Problem Identification and Resolution

Through review of CR, Nuclear Oversight field observations and the CRACS system health report, the inspectors verified that problems associated with the control and mitigation of in-plant airborne radioactivity are being identified at an appropriate threshold and are properly addressed for resolution in the corrective action program.

b. Findings

No findings were identified.

#### 4. OTHER ACTIVITIES [OA]

##### 4OA1 Performance Indicator (PI) Verification (71151)

###### Cornerstone: Initiating Events

###### a. Inspection Scope (4 Samples)

The inspectors reviewed Dominion submittals for the PIs listed below to verify the accuracy of the data reported during that period. The PI definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Indicator Guideline," Revision 5, were used to verify the basis for reporting each data element. The inspectors reviewed portions of the operations logs, monthly operating reports, and Licensee Event Reports (LER) and discussed the methods for compiling and reporting the PIs with cognizant licensing and engineering personnel. Documents reviewed during the inspection are listed in the Attachment.

###### Unit 2

- Reactor Coolant System Activity;
- Reactor Coolant System Leakage;

###### Unit 3

- Reactor Coolant System Activity; and
- Reactor Coolant System Leakage.

###### b. Findings

No findings were identified.

##### 4OA2 Identification and Resolution of Problems (71152)

###### .1 Review of Items Entered into the Corrective Action Program

###### a. Inspection Scope

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into Dominion's corrective action program. This was accomplished by reviewing the description of each new CR and attending daily management review committee meetings. Documents reviewed during the inspection are listed in the Attachment.



b. Findings

No findings were identified.

.2 Annual Sample: Unit 3 EOP 3506, Loss of All Charging Pumps

a. Inspection Scope (1 sample)

The inspectors reviewed Dominion's implementation of changes to Unit 3 Emergency Operating Procedure (EOP) 3506 and corrective actions associated with issues identified with this procedure's deviation from Westinghouse Owners Group (WOG) Emergency Response Guidelines (ERG). Related CRs and associated actions were reviewed against the requirements of Dominion's corrective action program to ensure the full extent of the issues were identified, appropriate evaluations were performed, and appropriate corrective actions were specified and prioritized. The inspectors interviewed relevant station personnel and reviewed WOG ERG background documents, procedure change documentation, and EOP deviation documents. Documents reviewed during the inspection are listed in the Attachment.

b. Findings and Observations

No findings were identified. The inspectors determined that initial proposed corrective actions were closed without appropriately addressing the issue of concern. After the NRC inspectors raised the issue a second time, Dominion initiated a second CR and developed and prioritized corrective actions to address the problem.

Dominion had developed EOP 3506 to implement an event mitigation strategy that deviated from the industry standard EOP mitigation strategy provided by the WOG ERGs. This new strategy had the operators exiting the WOG ERG network and conducting a plant cooldown and depressurization in the operating procedures, if a charging pump could not be promptly restored. This revised strategy had previously been considered by the WOG in 1984 and determined not to be necessary or appropriate. Dominion elected to implement the revised strategy without revisiting the original WOG decision based on new insights since 1984. While licensees may deviate from the WOG ERG network, these deviations should only be justified based on site specific equipment variations. Deviating from the fundamental event mitigation strategy, based entirely on non-site specific event strategy approaches, is not appropriate without first approaching the Owners Group for additional consideration and guidance by the industry experts.

CRs 395584 and 395591 were initiated in September 2010 to address identified problems with the EOP status of EOP 3506 and the guidance in OP 3272, "EOP Users Guide," relating to parallel use of ERG derived procedures with non-ERG EOPs. These CRs were subsequently closed to an action tracking system outside of the corrective action process. In February 2011, the inspectors identified that no changes had been implemented to ES-0.1, EOP 3506 or OP 3272. Subsequently, CR 416445 was initiated to re-address the problem. It was determined that EOP 3506 cannot be properly

implemented as written in light of conflicts with ES 0.1 goals and EOP Users Guide parallel performance requirements. Corrective actions were defined to return Millstone Unit 3 EOPs into alignment with the WOG ERGs by:

- Changing EOP 3506 to an AOP;
- Deleting guidance in 3506 for the cooldown / depressurization strategy; and
- Modifying rules of usage for non-ERG derived EOPs to clarify they are not included in the exemption from the 'parallel use' requirement (an exemption is allowed for other procedures such as GAs, AOPs and EOP-related sections of OPs).

The inspectors screened the procedure compliance issues in accordance with NRC Inspection Manual Chapter (IMC) 0612 Appendix B, "Issue Screening," and determined that they constitute issues of minor significance that are not subject to enforcement action in accordance with the NRC's Enforcement Policy.

4OA3 Event Follow-up (71153 – 2 samples)

.1 Unit 2 Unplanned Power Transient during Control Valve Testing

a. Inspection Scope

On February 12, 2011, Millstone Unit 2 experienced an unplanned power transient while conducting turbine control valve testing. Several human errors by the control room team caused reactor power to increase from 88 percent to 96 percent over approximately three minutes. The event was categorized as a level 2 reactivity management event in accordance with OP-AA-300, "Reactivity Management".

The inspectors evaluated the adequacy of operator actions in accordance with approved procedures and TS requirements. The inspectors performed walkdowns of the control room and interviewed personnel. The inspectors also reviewed the sequence of events information in order to determine if there were any other plant or equipment anomalies. In response to this event, a determination was made using the decision process in Inspection Manual Chapter 0309 to send a Special Inspection Team (SIT) from Region 1 to conduct the follow up investigation.

b. Findings

Any findings as a result of the inspection effort by this SIT will be documented in the Special Inspection report 05000336/2011008, due to be published soon.

.2 (Closed) LER 05000336/2010-003, Reactor Trip on Low Condenser Vacuum

a. Inspection Scope

On November 28, 2010, Millstone Unit 2's reactor automatically tripped from 100 percent power. Prior to the event, Millstone was establishing conditions to perform a backwash of the 'B' condenser water box. Operators pressed the stop pushbutton for the 'B' circulating water (CW) pump and were closing the 'A' and 'B' water box outlet valves when the 'A' CW pump automatically ramped off. Upon loss of the second pump in the condenser, the condenser vacuum degraded to the low condenser vacuum trip set point, causing an automatic turbine generator trip which then caused an automatic reactor trip.

b. Findings

This issue was previously documented in NRC Inspection Report 05000336/2010005 as a Green finding. The LER was reviewed and no additional findings were identified. This LER is closed.

4OA5 Other Activities

.1 Institute of Nuclear Operators (INPO) Evaluation Report

a. Inspection Scope (1 Sample)

The inspectors reviewed the report for the INPO plant assessment of Millstone Nuclear Generating Station conducted August 2010. The inspectors reviewed the report to ensure that issues identified were consistent with the NRC perspectives of Millstone performance and to verify that the INPO team did not identify any safety significant issues requiring further NRC follow-up.

b. Findings

No findings were identified.

.2 (Closed) Notice of Violation (NOV) 05000423/2010011-01 - Failure to Develop a Mitigation Strategy Required by 10 CFR 50.54(hh)

a. Inspection Scope (1 Sample)

The inspector reviewed the actions taken by Dominion to address the issues identified in an NOV documented in NRC inspection report 05000423/2010011, concerning a single strategy put in place as required by 10 CFR 50.54 (hh)(2)(ii) and License Condition 2.C.(10). These actions included additional staged equipment, engineering justifications, and implementing procedure changes. The inspector concluded that the actions taken addressed the technical issues and provided an adequate level of confidence that the associated strategy could be accomplished successfully.

b. Findings

No findings were identified.

4OA6 Meetings, including Exit

Exit Meeting Summary

On April 20, 2011, the resident inspectors presented the overall inspection results to Mr. A. J. Jordan and members of his staff. The inspectors confirmed that no proprietary information was provided or examined during the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

**SUPPLEMENTAL INFORMATION****KEY POINTS OF CONTACT**Dominion personnel

L. Armstrong	Manager, Training
R. Arquaro	Unit 3 Shift Manager
G. Auria	Nuclear Chemistry Supervisor
B. Barron	Manager, Nuclear Oversight
B. Bartron	Supervisor, Licensing
E. Brodeur	Shift 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
J. Dorosky	Health Physicist III
B. Ferguson	Nuclear Quality Assurance Specialist
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
C. Houska	I&C Technician
A. Jordan	Site Vice President
B. Kelly	Unit 3 Work Control SRO
K. Keith	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
M. Martell	Unit 3 Shift Manager
M. Noniewicz	Unit 3 Reactor Operator
M. O'Connor	Nuclear Specialist, Outage and Planning
R. Parrette	Operations Manager on-Call
D. Reed	Unit 3 Shift Manager
R. Riley	Supervisor, Nuclear Shift Operations Unit 3
M. Roche	Senior Nuclear Chemistry Technician
D. Rowe	Shift Manager
L. Salyards	Licensing, Nuclear Technology Specialist
M. Sartain	Director, Nuclear Engineering
J. Semancik	Plant Manager
M. Sibilia	Unit 3 Balance of Plant Operator
A. Smith	Asset Management
D. Smith	Manager, Emergency Preparedness
S. Smith	Manager, Engineering

J. Stoddard                      Unit 3 Shift Manager  
 S. Turowski                    Supervisor, Health Physics Technical Services  
 C. Vournazos                  IT Specialist, Meteorological Data

**LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

Opened and Closed

05000423/2011002-01      NCV    Failure to Prevent Safety Related Cables from Being Submerged (Section 1R06)

05000423/2011002-02      NCV    Improper Restoration of Air Conditioning Equipment Following Maintenance Results in Inoperability of 'B' Train of Recirculation Spray System (Section 1R19)

Closed

05000336/2010003          LER    Reactor Trip on Low Condenser Vacuum (Section 4OA3)

05000423/2010011-01      NOV    Failure to develop a mitigation strategy required by 10 CFR 50.54(hh) (Section 4OA5)

**LIST OF DOCUMENTS REVIEWED**

**Section 1R01: Adverse Weather Protection**

AOP 2560, "Storms, High Winds and High Tides," Revision 010-04  
 AOP 3569, "Severe Weather Conditions," Revision 016-00  
 C OP 200.6, "Storms and Other Hazardous Phenomena (Preparation and Recovery)," Revision 002-01

**Section 1R04: Equipment Alignment**

Containment Spray System Health Report 4<sup>th</sup> Quarter 2009 and 2010  
 Containment Spray System Unavailability 2009 and 2010  
 OP 2308-002, "HPSI System Valve Alignment, Facility 2," Revision 000-03  
 OP 2309-001, "CS System Valve Alignment Verification, Facility 1," Revision 000-04  
 OP 2309-002, "CS System Valve Alignment Verification, Facility 2," Revision 000-05  
 OP 2346A-011, "'A' DG Service Water Valve Alignment," Revision 000-03  
 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  
 OP 3304A-001, "MB3 Charging and Letdown Lineup," Revision 005-03  
 OP3304A-003, "Charging and Letdown Lineup," Revision 013-04  
 OP 3326-002, "Train 'B' Service Water System," Revision 010-03  
 OP 3326-008, "EDG 'B' Service Water System Supply," Revision 004-01  
 OP 3326-010, "Service Water System – Control Building Air Cond 'B' Supply," Revision 007-02  
 OP 3326-014, "ESF Bldg Emergency Ventilation 'B' Service Water System Supply," Revision 008-01  
 OP 3326-017, "RSS Train 'B' Service Water System Supply," Revision 004-01

OP3346B Attachment 4, "Valve lineup for 'B' Diesel Fuel Oil," Revision 4  
OP3346B Attachment 7, "'B' Diesel Fuel Oil Electrical Alignment," Revision 1  
OP3346B Attachment 2, "EDG 'B' – Cooling Water Valve Lineup," Revision 7  
MRE 010544  
MRE010606  
MRE011182  
MRE011252  
MRE011367  
MRE011631  
MRE011632  
53102314764  
CR-05-07023  
CR363499  
CR393939  
CR412290

**Section 1R05: Fire Protection**

Millstone Unit 2 Fire Hazards Analysis, Revision 11  
Millstone Unit 2 Fire Fighting Strategies April 2005  
Fire Brigade Drill and Assessment for Unit 3 Turbine Building 38'6" MCC 32-2A Cabinet 14D  
CR417179

**Section 1R06: Flood Protection Measures**

W2-517-1070-RE, "Unit 2 Internal Flooding Evaluation," Revision 0  
System Health Report, Station Sumps and Drains 4<sup>th</sup> Quarter 2010  
MRE011610  
53M20800203  
53102266290  
53102266292

**Section 1R07: Heat Sink Performance**

ER-AA-HTX-1002, "Heat Exchanger Inspection Form", Revision 1  
MP 2701J-096, "Heat Exchanger 'As Found' Inspection Checklist," Revision 007-01

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

Millstone Unit 2 ES11101A, "Unit 2 LORT Evaluated Simulator Exam," Revision 0  
Millstone Unit 3 LORT Exam SE 50, Revision 2

**Section 1R12: Maintenance Effectiveness**

96-001, "Empirical Adjustment of the MP# SW Model to 1995 Flow Test Data and Incorporation of the Latest SW System Design Change Notices," Revision 01  
EN 31121, "IST Pump Operational Readiness Evaluation," Revision 7  
System Health Report, Main Steam Vents and Drains and SG Blowdown, 4<sup>th</sup> Quarter 2010  
System Health Report, Reactor Coolant, 4<sup>th</sup> Quarter 2009 and 4<sup>th</sup> Quarter 2010  
System Health Report, Service Water, 4<sup>th</sup> Quarter 2010  
System Health Report, 120 Volt AC Distribution, 4<sup>th</sup> Quarter 2009  
System Health Report, 120 Volt AC Distribution and Vital Regulated Instrument AC, 4th Quarter 2010

System Health Report, 480 Volt AC MCC, 4<sup>th</sup> Quarter 2009 and 4<sup>th</sup> Quarter 2010  
Maintenance Rule Scoping Tables

Millstone Unit 2, Maintenance Rule Scoping Tables

Millstone Unit 2, Pressurizer Unavailability, January 2009 – December 2010

Millstone Unit 2, 480 Volt MCC Unavailability February 2009 – January 2011

Millstone Unit 3, Service Water Unavailability, February 2009 – January 2011

Millstone Unit 3, 3MSS\*MOV74A-D Unavailability February 2009 – January 2011

CR111344

CR347716

CR357873

CR409403

MRE010244

MRE010266

MRE010288

MRE010518

MRE010524

MRE010528

MRE010804

MRE010805

MRE010809

MRE010814

MRE010845

MRE011016

MRE011262

MRE011266

MRE011308

MRE011410

MRE011426

MRE011434

MRE011453

MRE011602

MRE011608

MRE011621

MRE011805

MRE011902

MRE011907

MRE011909

MRE011925

MRE012002

MRE012070

MRE012080

MRE012087

MRE012121

MRE012123

MRE012127

MRE012128

MRE012134

MRE012160



MRE012299  
MRE012332  
MRE012430  
MRE012431  
MRE012470  
MRE012510  
MRE012573  
MRE012574  
MRE012713  
MRE012730  
MRE012731  
MRE012762  
MRE012846  
MRE012904  
MRE012941  
MRE013045

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

OP 3325A.1, "Condenser Backflush of Circulating Water Bays," Revision 000-03  
OP 3327, "Travelling Screen Wash," Revision 019-08  
SP 2605W, "Leak Testing of Containment Sump Header Piping, Facility 1 and Facility 2,"  
Revision 000-02  
NERF 2011015, "Condition Discovered on February 13, 2011 could have prevented fulfillment  
of Safety Function to control release of radioactive material"  
CR 413480, "ESF Building SLCRs Boot Tears in 2 Locations, 'A' SI Pump Cubicle," dated  
February 11, 2011  
CR415899, "3HVQ\*ACUS2B did not start when manual start was attempted," dated March 3,  
2011  
WO530112601973

**Section 1R15: Operability Evaluations**

SP 2402PD, "Channel 'D' SPEC 200 Safety Parameters Functional Test," Revision 003-02

**Section 1R18: Plant Modifications**

SP 2602E, "Pressurizer Heater Capacity Test," Revision 000-00  
53102405192  
CR409465

**Section 1R19: Post Maintenance Testing**

OP 3314D, "ESF Building Ventilation and Air Conditioning," Revision 011-04  
Tag Out Coversheet for Calibration of 3HVQ\*ACUS2B Low Oil Pressure Shutdown & Alarm  
Differential Pressure Switch  
Millstone Unit 3 Control Room Logs, March 2, 2011 and March 3, 2011  
AWO 53102378189, "Oil Change due to Pump oil Sample in 'Monitor' Status"  
SP 3608.2, "Safety Injection Pump 'B' Quarterly IST Pump Test", Revision 010  
SP 3626.3, "Service Water Operability Tests," Revision 010-08  
SP 3626.3-012, "3SWP\*MOV57A and MOV57C, RSS Cooler outlets, Stroke Time," Revision  
002-05

MP-20-WP-GLD 40, Attachment 4

53M20401619  
53M20404513  
53M20604371  
53M20700473  
53M20705769  
53M20707058  
53M20804964  
53M20806426  
53M30601664  
53102317239  
53102358457  
53102358931  
53102361744  
53102368939  
53102379895  
53102601973  
CR409570  
CR410793  
CR410870  
CR410892  
CR410893  
CR410900  
CR410929  
CR411121  
CR411136  
CR411154  
CR411159  
CR411159  
CR411217  
CR411172  
CR411239  
CR411262  
CR411256  
CR411257  
CR413162  
CR413350  
CR413583  
CR413473  
CR415773  
CR415954  
CR415899  
CR417419

**Section 1R22: Surveillance Testing**

CP 2802N, "Primary Systems Sampling and Analysis," Revision 000-03  
SP 2602A, "Manual RCS: Leak Rate Determination," Revision 006-02  
SP 2611B-002, "C' RBCCW Pump IST," Revision 002-01

SP 3604A.3, "Charging Pump 'C' Operational Readiness Test," Revision 011-04  
SP 3604A.3-001, "3CHS\*P3C Quarterly IST Pump Test (Two Charging Pumps Aligned for Service)," Revision 013  
SP 21157, "HPSI System and ECCS Suction Leak Test," Revision 008-02  
SP 3601F.6, "Reactor Coolant System Water Inventory Measurement," Revision 006-03  
SP 3601F.6-001, "RCS Inventory Balance"  
C OP 200.15, "RCS Leakage Trending and Investigation," Revision 001-01  
CR411667  
CR415760, "Procedure change requested for SP 3601F.6, RCS Water Inventory Measurement"

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

Procedures

SP 2404Z1/2, Revision 2, CRACS Facility Z1/2 Area Radiation Monitor RIT-9799 A/B Functional Test  
SP 2404BA1/2, Revision 1, Control Room Ventilation Radiation Monitor RM-9799 A/B Calibration  
RPM 2.2.6, Revision 12, Continuous Air Monitors  
RPM 4.1.11, Revision 3, AMS-4 Air Monitoring System Calibration  
SFP 24, Revision 3, Inspection and Inventory of Self Contained Breathing Apparatus  
RPM 2.3.1, Revision 7, Quantitative Respirator Fit Testing Using the TSI Porta Count  
RP-AA-300, Revision 4, ALARA Reviews and Reports  
RP-AA-26, Revision 0, Alpha Monitoring  
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  
MP-19-RSP-PRG, Revision 4, Respiratory Protection  
RPM 5.4.1, Revision 7, Issue and Control of Respiratory Protection Equipment  
EN 21235, Revision 3, Millstone Unit 2 Radiation Monitor High Radiation Set-points

Condition Reports

406896, 407799, 407917, 410723, 411502, 414163, 406814, 411502, 406838, 404796, 405914, 406274, 406831, 408106, 407364, 399682, 401788, 405951, 406361, 415528, 382239

Nuclear Oversight Field Observation Report Summary

December 21, 2010, December 07, 2010, October 26, 2010, September 28, 2010, August 3, 2010, July 20, 2010

ALARA Committee Meeting Minutes

Third Quarter 2010, Fourth Quarter 2010, First Quarter 2011

Calibration Records Reviewed

AMS-4, Serial Nos. 1270, 657, 1698, 662, 1695, 783, 1697, 781, 1696, 1675, 783

SCBA Packs Inspected & Functional Tests Reviewed (Regulator Nos.)

89601073, 99700206, 89300056, 3880163, 89300070

SCBA Personnel Qualification Reports

Operations Department  
Radiation Protection Department

Surveillance Tests – Unit 2 Control Room Emergency Ventilation System

SP2404AZ1, Train A Rad Monitor (R9797A) Functional Test - Monthly  
SP2404AZ2, Train B Rad Monitor (R9799B) Functional Test - Monthly  
SP2609F, Filter Testing, Flow and D/P, Facility 1 and 2

Miscellaneous Documents

Alpha Characterization Report for Unit 2 and Unit 3 for 2008, 2009, and 2010  
System Health Report for Unit 2 Control Room Air Conditioning System

2R20 ALARA Plans (AP)

AP-2-11-01, Reactor vessel disassembly/re-assembly  
AP-2-11-07, SG corrective & preventative maintenance activities  
AP-2-11-13, Scaffolding installation/removal  
AP-2-11-16, 'C' reactor coolant pump motor and seal replacement  
AP-2-11-26, Radiation Protection Outage Support Activities

ALARA Evaluations (AE)

AE 2-10-06, Unit 2 'C' charging pump motor replacement  
AE 3-10-16, Unit 3 'C' charging pump rotating assembly replacement  
AE 2-10-03, Unit 2 in containment inspection of 2-FW-261B  
AE 2-10-04, Unit 2 in containment prepare repair plan for 2-FW-261B  
AE 2-10-05, Unit 2 in containment lubricate bonnet bolting for 2-FW-261B

**Section 40A1: Performance Indicator (PI) Verification**

CP 2802N, "Primary System Sampling and Analysis," Revision 000-03  
Millstone Nuclear Power Station Gamma Spectrum Analysis, January 20, 2011  
Reactor Coolant System Activity Performance Indicator 2010  
Reactor Coolant System Leakage Performance Indicator 2010  
SP 2619A-001, "Control Room Daily Surveillance," Revision 046-12  
SP 3601F.6, "Reactor Coolant System Water Inventory Measurement," Revision 006-03  
SP 3601F.6-001, "RCS Inventory Balance"

**Section 40A2: Identification and Resolution of Problems**

Condition Reports

CR 323486  
CR 395584  
CR 395591  
CR 413185  
CR 416445

Procedures

EOP 3506, Loss of All Charging Pumps, Revision 009-02  
EOP 35 E-0, Reactor Trip or Safety Injection, Revision 26  
EOP 35 ES-0.1, Reactor Trip Response, Revision 24  
OP 3272, EOP Users Guide, Revision 008-11

OP 3265, EOP Network Procedure Revision Process, Revision 009-01  
OP 3266, EOP Writers Guide, Revision 006-03  
OP-AP-104, Emergency and Abnormal Operating Procedures, Revision 2

Miscellaneous Documents

DW-84-006, WOG ERG Direct Work Request on Loss of All Charging Pumps  
Millstone Step Deviation Document for EOP 35 ES-0.1, Revision 24

**Section 40A5: Other Activities**

SAG-9 Revision 10  
CR390275  
Drawing 25212-28912  
Calculation/Tech memo NUCENG-10-17  
Calculation W3-517-981RE

**LIST OF ACRONYMS**

AC	Alternating Current
ADAMS	Agencywide Documents Access and Management System
ALARA	As Low As Reasonably Achievable
AOP	Abnormal Operating Procedure
AP	ALARA Plans
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CRACS	Control Room Air Conditioning System
CR	Condition Report
CW	Circulating Water
DG	Diesel Generator
DNB	Departure from Nucleate Boiling
DNC	Dominion Nuclear Connecticut
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
DW	Direct Work Request
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
EOP	Emergency Operating Procedure
EP	Emergency Preparedness
ERG	Emergency Response Guideline
ESAS	Engineered Safety-Feature Actuation System
ESF	Engineered Safety Feature
FIN	Finding
FSAR	Final Safety Analysis Report
GA	Generic Attachment
HPSI	High Pressure Safety Injection
I&C	Instrumentation and Control

IMC	Inspection Manual Chapter
INPO	Institute of Nuclear Operations
IOD	Immediate Operability Determination
IST	In-Service Testing
LCO	Limiting Condition for Operations
LER	Licensee Event Reports
LHRA	Locked High Radiation Area
MCC	Motor Control Center
MOV	Motor Operated Valves
mrem	millirem
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NOV	Notice of Violation
NRC	Nuclear Regulatory Commission
OD	Operability Determinations
OE	Operating Experience
OOS	Out Of Service
OP	Operating Procedure
PARS	Publicly Available Records System
PI	Performance Indicator
PI&R	Problem Identification and Resolution
PMT	Post Maintenance Testing
RBCCW	Reactor Building Closed Cooling Water
RCA	Radiologically Controlled Area
RCS	Reactor Coolant System
RSS	Recirculation Spray System
RWP	Radiological Work Permit
SCBA	Self Contained Breathing Apparatus
SDP	Significance Determination Process
SIH	Safety Injection High
SIT	Special Inspection Team
SG	Steam Generator
SLCRS	Supplementary Leak Collection and Release System
SW	Service Water
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
WOG	Westinghouse Owners Group



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

May 10, 2011

**LICENSEE:** DOMINION NUCLEAR CONNECTICUT, INC.

**FACILITY:** MILLSTONE POWER STATION, UNIT NOS. 2 AND 3

**SUBJECT:** SUMMARY OF FEBRUARY 15, 2011, MEETING WITH DOMINION NUCLEAR CONNECTICUT, INC., DISCUSSING MILLSTONE POWER STATION, UNIT NOS. 2 AND 3 LICENSING ACTIVITIES

On February 15, 2011, 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 licensing activities at Millstone Power Station, Unit Nos. 2 and 3 (Millstone). A list of attendees is provided as Enclosure 1.

DNC representatives presented information regarding the self-assessment that was performed on licensing activities at Millstone. The NRC staff queried the licensee about the DNC team that performed the assessment and any outreach performed. DNC stated that the assessment was an internal self-assessment. DNC also stated that they reached out to Florida Power and Light and Exelon for benchmarking purposes. The NRC staff asked about licensing issues identified at the other Dominion Fleet sites (North Anna Power Station, Unit Nos. 1 and 2; Kewaunee Power Station; and Surry Power Station, Unit Nos. 1 and 2), and questioned how the other site's activities compared to the activities at Millstone. DNC stated that the type of licensing issues are similar, but the number of issues have not been compared. DNC said they will address this at a future Dominion Fleet public meeting.

Proposed actions were provided by DNC (Agencywide Documents Access and Management System Accession No. ML110750462) and are included as Enclosure 3. The NRC asked DNC about the time frame for implementing the proposed changes. DNC stated that implementation has begun with incorporation into Millstone procedures and that they intend to convert to Dominion Fleet level procedures for licensing activities over the next several years.

The NRC staff inquired about the role of the Safety Review Committee with regard to submittals to the NRC. The NRC staff wanted to understand why the Safety Review Committee did not identify any of these licensing issues during their review. DNC stated that only a sub-set of documents go through the Committee and that the Committee's focus is technical evaluation. DNC also went over, in detail, their process for submitting documents to the NRC. The NRC staff questioned the licensee about the percentage of licensing activity-related condition reports that were self-revealing and NRC-identified vice DNC-identified. DNC did not have the requested information available at the meeting. DNC stated that condition report thresholds are being developed for regulatory correspondence.

The NRC staff asked about apparent cause or root cause analysis performed for the licensing issues and whether DNC's program is properly categorizing conditions that result from a failure to meet a regulatory requirement. DNC stated that they looked for a common cause, but did not consider the licensing issues to be a condition adverse to quality in accordance with industry guidance; therefore DNC did not perform a root cause analysis. NRC staff suggested that DNC review their quality assurance program in this area, since these programs typically require any condition that results in a violation of NRC regulations to be categorized as a significant condition adverse to quality, which requires a root cause analysis.

The NRC staff asked DNC to discuss their process for design changes with respect to updating the Updated Final Safety Analysis Report (UFSAR) and usage of 10 CFR 50.59. DNC stated that they have a new electronic system to ensure that all design changes are reviewed with respect to the UFSAR. DNC affirmed that they understand that the intent of a technical specification cannot be altered, without prior NRC staff approval, by a technical specification basis or UFSAR change. Changes that would alter the intent of the technical specification must receive prior NRC approval.

Although the actions proposed by DNC appeared appropriate, the NRC staff expressed that they remained concerned about the conduct of DNC's licensing activities for Millstone. The NRC staff will be monitoring the effectiveness of DNC's proposed actions.

Members of the public were in attendance. Public Meeting Feedback forms were not received.

Please direct any inquiries to me at 301-415-3204, or [John.Hughey@nrc.gov](mailto:John.Hughey@nrc.gov).



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

Docket Nos. 50-336 and 50-423

Enclosures:

1. List of Attendees
2. List of Background Information including the ADAMS Accession numbers
3. DNC's assessment

cc w/encls: Distribution via Listserv



LIST OF ATTENDEES

FEBRUARY 15, 2011

MEETING WITH DOMINION NUCLEAR CONNECTICUT, INC.

MILLSTONE POWER STATION, UNIT NOS. 2 AND 3 LICENSING ACTIVITIES

NAME	ORGANIZATION
Carleen Sanders	NRC
Harold Chernoff	NRC
Jeff Whited	NRC
John Hughey	NRC
Wanda Craft	Dominion
William D. Bartron	Dominion
Chris Funderburk	Dominion
Jack Gadzala	Kewaunee
Tom Breene	Kewaunee
Jeff Hanson	Exelon
Marylou Calderone	Dominion
Mohamed Elmaghrabi	Dominion
Craig Sly	Dominion
Tom Shaub	Dominion
Jim Connolly	FPL
Bill Cummings	Connecticut Post
Nancy Burton	Connecticut Coalition Against Millstone
Bill Brown	Dominion
Richard MacManus	Dominion

LIST OF BACKGROUND INFORMATION INCLUDING  
THE AGENCYWIDE DOCUMENTS ACCESS AND MANGEMENT SYSTEM  
ACCESSION NUMBERS

1. "Update to the Final Safety Analysis Report for Millstone Power Station, Unit Nos. 1, 2, and 3," dated June 22, 2009 (Dominion Nuclear Connecticut, Inc. (DNC)) (Agencywide Documents Access and Management System (ADAMS) Accession No. ML092380495).
2. "Millstone Power Station, Unit Nos. 1, 2, and 3 - Review of Update to the Final Safety Analysis Report," dated June 30, 2010 (Nuclear Regulatory Commission (NRC)) (ADAMS Accession No. ML101800008).
3. "Millstone Power Station Unit 2, Alternative Request RR-89-67 for the P40A RCP [reactor cooler pump] Seal Cooler Return Tubing," dated September 22, 2009 (DNC) (ADAMS Accession No. ML092710151).
4. "Millstone Power Station, Unit No. 2 – Issuance of Relief Request RR-89-67 Regarding the Repair of Reactor Coolant Pump Seal Cooler Return Tubing and Weld," dated April 26, 2010 (NRC) (ADAMS Accession No. ML093570237).
5. "Millstone Power Station Unit 2, Alternative Request RR-89-68 for use of Code Case N-722-1 for Bare Metal Visual Examination of the RPV [reactor pressure vessel] Flange Seal Leak-off Line Welds Made of Alloy 600/82/182 Materials," dated October 1, 2009 (DNC) (ADAMS Accession No. ML092740662).
6. Federal Register Notice (73 FR 52739).
7. "Millstone Power Station, Unit No. 2 – Issuance of Relief Request RR-89-68 Regarding Use of American Society of Mechanical Engineering Code Case N-722-1," dated October 27, 2010 (NRC) (ADAMS Accession No. ML102780086).
8. "Millstone Power Station Unit 3, Relief Request IR-3-01 Response to Request for Additional Information Regarding Snubber Inspection and Testing for Third 10 Year Interval," dated December 16, 2009 (DNC) (ADAMS Accession No. ML102780086).
9. "Millstone Power Station Unit 3, Request for Additional Information Regarding Relief Requests for Limited Coverage Examinations Performed in the Second 10-year Inspection Interval," dated January 20, 2011 (DNC) (ADAMS Accession No. ML110250259).
10. "Millstone Power Station Units 1, 2, 3, and ISFSI [independent spent fuel storage installation], 10 CFR 50.59, 10 CFR 72.48, and Commitment Change Report for 2008," dated June 30, 2009 (DNC) (ADAMS Accession No. ML091900371).

11. "Millstone Power Station Unit 3, License Amendment Request to Revise Technical Specification 6.8.4.g, "Steam Generator (SG) Program," and TS 6.9.1.7, "Steam Generator Tube Inspection Report" for the One-Time Alternate Repair Criteria (H\*)," dated November 23, 2009 (DNC) (ADAMS Accession No. ML093620085).
12. "Request for Withholding Information from Public Disclosure for Millstone Power Station, Unit No. 3," dated September 22, 2010 (NRC) (ADAMS Accession No. ML102160749).
13. "Millstone Power Station Unit 3, Response to Request for Additional Information Regarding 2008 Steam Generator Tube Inspections," dated November 23, 2009 (DNC) (ADAMS Accession No. ML093350528).
14. "Millstone Power Station, Unit No. 2 – Issuance of Relief Request RR-04-02 Regarding Alternative VT-2 Pressure Testing Requirements for the Lower Portion of the Reactor Pressure Vessel," dated December 3, 2010 (NRC) (ADAMS Accession No. ML102940440).
15. "Millstone Power Station, Unit No. 3 – Request for Additional Information Regarding the Update to the Risk-Informed Inspection Program for the Third 10-Year Inspection Interval," dated November 29, 2010 (NRC) (ADAMS Accession ML102940492).
16. "Millstone Power Station Unit 3, License Amendment Request to Revise Technical Specification (TS) 6.8.4.g, "Steam Generator (SG) Program," and TS 6.9.1.7, "Steam Generator Tube Inspection Report," for Temporary Alternate Repair Criteria (H\*)," dated January 20, 2011 (DNC) (ADAMS Accession No. ML110280208).

DOMINION NUCLEAR CONNECTICUT, INC.  
ASSESSMENT OF MILLSTONE POWER STATION, UNIT NOS. 2 AND 3  
LICENSING ACTIVITIES

Summary of Dominion Regulatory Correspondence Self-Assessment

Dominion performed an internal self-assessment of NRC regulatory correspondence.

The purpose of the self-assessment was to determine what timeliness, quality, and procedure compliance issues have contributed to less than optimal regulatory submittals for the Dominion nuclear fleet.

The raw data for the self-assessment was a list of outgoing NRC correspondence from January 1, 2009, to October 20, 2010. Evaluation criteria were developed to assess correspondence for timeliness and quality issues.

The results were tabulated and analyzed to identify the most frequent problems and attributes associated with correspondence deficiencies.

A summary of planned actions to address the identified problems with regulatory correspondence was developed.

Appropriate procedural changes are expected to be completed by the end of second quarter 2011. Fleet implementation and change management activities will occur on a schedule commensurate with site resources and work schedules.

The NRC staff asked about apparent cause or root cause analysis performed for the licensing issues and whether DNC's program is properly categorizing conditions that result from a failure to meet a regulatory requirement. DNC stated that they looked for a common cause, but did not consider the licensing issues to be a condition adverse to quality in accordance with industry guidance; therefore DNC did not perform a root cause analysis. NRC staff suggested that DNC review their quality assurance program in this area, since these programs typically require any condition that results in a violation of NRC regulations to be categorized as a significant condition adverse to quality, which requires a root cause analysis.

The NRC staff asked DNC to discuss their process for design changes with respect to updating the Updated Final Safety Analysis Report (UFSAR) and usage of 10 CFR 50.59. DNC stated that they have a new electronic system to ensure that all design changes are reviewed with respect to the UFSAR. DNC affirmed that they understand that the intent of a technical specification cannot be altered, without prior NRC staff approval, by a technical specification basis or UFSAR change. Changes that would alter the intent of the technical specification must receive prior NRC approval.

Although the actions proposed by DNC appeared appropriate, the NRC staff expressed that they remained concerned about the conduct of DNC's licensing activities for Millstone. The NRC staff will be monitoring the effectiveness of DNC's proposed actions.

Members of the public were in attendance. Public Meeting Feedback forms were not received.

Please direct any inquiries to me at 301-415-3204, or John.Hughey@nrc.gov.

/RA/

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

Docket Nos. 50-336 and 50-423

Enclosures:

1. List of Attendees
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RidsNrrMillstone Resource		

ADAMS Accession No. PKG: **ML110690723** Meeting Notice: ML110180091/Revised Meeting Notice: ML110310682  
Meeting Summary: ML110690794 \* via email

OFFICE	DORL/LPLI-2/PM	DORL/LPLI-2/LA	DORL/LPLI-2/BC	DORL/LPLI-2/PM
NAME	JHughey	ABaxter *	HChernoff	JHughey
DATE	4/26/2011	4/25/11	5/9/2011	5/10/2011

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

May 9, 2011

Holders of Licenses for Operating  
Power Reactors listed in the Enclosure

SUBJECT: CYBER SECURITY PLAN IMPLEMENTATION SCHEDULE

In accordance with the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) 73.54, you submitted a cyber security plan (CSP), requesting review and approval by the U.S. Nuclear Regulation Commission (NRC). In addition, you submitted a CSP implementation schedule for NRC approval, also required by 10 CFR 73.54. As stated in that regulation, "implementation of the licensee's cyber security program must be consistent with the approved schedule."

The NRC staff is currently reviewing your CSP submittal and supplemental responses to requests for additional information. The NRC staff is also reviewing your revised CSP implementation schedule, including the proposed key intermediate milestone dates and the full CSP implementation date.

The purpose of this letter is to inform you that, if the NRC staff determines that your CSP and proposed implementation schedule meet all regulatory requirements, the following paragraph will be included in the license amendment authorization page:

This license amendment is effective as of the date of its issuance. The implementation of the cyber security plan (CSP), including the key intermediate milestone dates and the full implementation date, shall be in accordance with the implementation schedule submitted by the licensee on [CSP implementation schedule submittal date], and approved by the NRC staff with this license amendment. All subsequent changes to the NRC-approved CSP implementation schedule will require prior NRC approval pursuant to 10 CFR 50.90.

- 2 -

Please contact your Licensing Project Manager if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "R. Pascarelli". The signature is fluid and cursive, with a large initial "R" and a distinct "i" at the end.

Robert J. Pascarelli, Chief  
Plant Licensing Branch III-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos.: See Enclosure

Enclosure: Addressee List

cc w/encl: Distribution via ListServ

### ADDRESSEE LIST

Facilities	Addressee
Arkansas Nuclear One, Units 1 and 2 Docket Nos. 50-313 & 50-368 License Nos. DPR-51, NPF-6	Christopher J. Schwartz Vice President, Operations Entergy Operations, Inc. Arkansas Nuclear One 1448 S.R. 333 Russellville, AR 72802
Beaver Valley Power Station, Unit Nos. 1 and 2 Docket Nos. 50-334 - 50-412 License Nos. DPR-66, NPF-73	Paul A. Harden Site Vice President FirstEnergy Nuclear Operating Company Beaver Valley Power Station P.O. Box 4, Route 168 Shippingport, PA 15077
Braidwood Station, Units 1 and 2 Docket Nos. STN 50-456 & STN 50-457 License Nos. NPF-72, NPF-77	Michael J. Pacilio President and Chief Nuclear Officer Exelon Generation Company, LLC 4300 Winfield Road Warrenville, IL 60555
Byron Station, Unit Nos. 1 and 2 Docket Nos. STN 50-454, STN 50-455 License Nos. NPF-37, NPF-66	
Clinton Power Station, Unit No. 1 Docket No. 50-461 License No. NPF-62	
Dresden Nuclear Power Station, Units 2 and 3 Docket Nos. 50-237, 50-249 License Nos. DPR-19, DPR-25	
LaSalle County Station, Units 1 and 2 Docket Nos. 50-373, 50-374 License Nos. NPF-11, NPF-18	
Quad Cities Nuclear Power Station, Units 1 and 2 Docket Nos. 50-254, 50-265 License Nos. DPR-29, DPR-30	



<p>Limerick Generating Station, Units 1 and 2  Docket Nos. 50-352, 50-353  License Nos. NPF-39, NPF-85</p>	<p>Michael J. Pacilio  President and Chief Nuclear Officer  Exelon Generation Company, LLC  4300 Winfield Road  Warrenville, IL 60555</p>
<p>Oyster Creek Nuclear Generating Station  Docket No. 50-219  License No. DPR-16</p>	
<p>Peach Bottom Atomic Power Station, Units 2 and 3  Docket Nos. 50-277, 50-278  License Nos. DPR-44, DPR-56</p>	
<p>Three Mile Island Nuclear Station, Unit 1  Docket No. 50-289  License No. DPR-50</p>	
<p>Browns Ferry Nuclear Plant, Units 1, 2, and 3  Docket Nos. 50-259, 50-260, &amp; 50-296  License Nos. DPR-33, DPR-52, DPR-68</p>	<p>Rodney M. Krich  Vice President, Nuclear Licensing  Tennessee Valley Authority  3R Lookout Place  1101 Market Street  Chattanooga, TN 37402-2801</p>
<p>Sequoyah Nuclear Plant, Units 1 and 2  Docket Nos. 50-327 and 50-328  License Nos. DPR-77 and DPR-79</p>	
<p>Watts Bar Nuclear Plant, Unit 1  Docket No. 50-390  License No. NPF-90</p>	
<p>Brunswick Steam Electric Plant, Units 1 and 2  Docket Nos. 50-325, 50-324  License Nos. DPR-71, DPR-62</p>	
<p>Shearon Harris Nuclear Power Plant, Unit 1  Docket No. 50-400  License No. NPF-63</p>	<p>C. S. Kamilaris  Director - Fleet Support Services  Progress Energy  PO Box 1551  411 Fayetteville Street Mall  Raleigh, NC 27602</p>

<p>H. B. Robinson Steam Electric Plant, Unit 2  Docket No. 50-261  License No. DPR-23</p>	<p>C. S. Kamilaris  Director - Fleet Support Services  Progress Energy  PO Box 1551  411 Fayetteville Street Mall  Raleigh, NC 27602</p>
<p>Crystal River Unit 3 Nuclear Generating Plant  Docket No. 50-302  License No. DPR-72</p>	
<p>Callaway Plant, Unit1  Docket No. 50-483  License No. NPF-30</p>	<p>Adam C. Heflin  Senior Vice President and  Chief Nuclear Officer  Union Electric Company  Ameren Missouri  P.O. Box 620  Fulton, MO 65251</p>
<p>Calvert Cliffs Nuclear Power Plant, Units 1 and 2  Docket Nos. 50-317, 50-318  License Nos. DPR-53, DPR-69</p>	<p>Maria Korsnick  Chief Nuclear Officer, SVP – Chief  Operations Officer  Constellation Energy Nuclear  Group, LLC  100 Constellation Way, Suite 200C  Baltimore, MD 21202</p>
<p>Nine Mile Point Nuclear Station,  Units 1 and 2  Docket Nos. 50-220 &amp; 50-410  License Nos. DPR-63 &amp; NPF-69</p>	
<p>R. E. Ginna Nuclear Power Plant  Docket No. 50-244  License No. DPR-18</p>	
<p>Catawba Nuclear Station, Units 1 and 2  Dockets Nos. 50-413, 50-414  License Nos. NPF-35, NPF-52</p>	<p>Michael R. Glover  General Manager, Nuclear Support  Duke Energy Carolinas, LLC  P.O. Box 1006  Charlotte, NC 28201-1106</p>

<p>McGuire Nuclear Station, Units 1 and 2  Docket Nos. 50-369 &amp; 50-370  License Nos. NPF-9 &amp; NPF-17</p>	<p>Michael R. Glover  General Manager, Nuclear Support  Nuclear Generation Duke Energy  Carolinas, LLC  P.O. Box 1006  Charlotte, NC 28201-1106</p>
<p>Oconee Nuclear Station, Units 1, 2, and 3  Docket Nos. 50-269, 50-270, &amp; 50-287  License Nos. DPR-38, DPR-47, &amp; DPR-55</p>	
<p>Columbia Generating Station  Docket No. 50-397  License No. NPF-21</p>	<p>Mark E. Reddeman  Chief Executive Officer  Energy Northwest  P.O. Box 968 (Mail Drop 1023)  Richland, WA 99352-0968</p>
<p>Comanche Peak Nuclear Power Plant  Units 1 and 2  Docket Nos. 50-445, 50-446  License Nos. NPF-87, NPF-89</p>	<p>Rafael Flores  Senior Vice President &amp; Chief Nuclear  Officer  Luminant Generation Company, LLC  P. O. Box 1002  6322 North FM 56  Glen Rose, TX 76043</p>
<p>Cooper Nuclear Station  Docket No. 50-298  License No. DPR-46</p>	<p>Demetrius L. Willis  General Manager of Plant Operations  Cooper Nuclear Station  P.O. Box 756  Brownville, NE 68321-0098</p>
<p>Davis-Besse Nuclear Power Station, Unit No. 1  Docket No. 50-346  License No. NPF-3</p>	<p>Barry S. Allen  Site Vice President  FirstEnergy Nuclear Operating Company  Davis-Besse Nuclear Power Station  5501 North State Route 2  Oak Harbor, OH 43449-9760</p>
<p>Diablo Canyon Nuclear Power Plant, Units 1 and 2  Docket Nos. 50-275 &amp; 50-323  License Nos. DPR-80 &amp; DPR-82</p>	<p>James R. Becker  Site Vice President  Pacific Gas and Electric Company  Diablo Canyon Power Plant  P.O. Box 3 Mail Station 104/6/601  Avila Beach, CA 93424</p>
<p>Donald C. Cook Nuclear Plant, Units 1 and 2  Docket Nos. 50-315 &amp; 50-316  License Nos. DPR-58 &amp; DPR-74</p>	<p>Joel P. Gebbie  Site Vice President  Indiana Michigan Power Company  One Cook Place  Bridgman, MI 49106</p>

<p>Duane Arnold Energy Center  Docket No. 50-331  License No. DPR-49</p>	<p>Christopher R. Costanzo  Vice President  Duane Arnold Energy Center  NextEra Energy Duane Arnold, LLC  3277 DAEC Road  Palo, IA 52324-9785</p>
<p>Edwin I. Hatch Nuclear Plant, Units 1 and 2  Docket Nos. 50-321 &amp; 50-366  License Nos. DPR-57 &amp; NPF-5</p>	<p>M. J. Ajluni, Nuclear Licensing Director  Southern Nuclear Operating  Company, Inc.  40 Inverness Center Parkway  P.O. Box 1295, Bin – 038  Birmingham, AL 35201-1295</p>
<p>Joseph M. Farley Nuclear Plant,  Units 1 and 2  Docket Nos. 50-348 &amp; 50-364  License Nos. NPF-2 &amp; NPF-8</p>	
<p>Vogtle Electric Generating Plant,  Units 1 and 2  Docket Nos. 50-424 &amp; 50-425  License Nos. NPF-68 &amp; NPF-81</p>	
<p>Fermi, Unit 2  Docket No. 50-341  License No. NPF-43</p>	<p>Jack M. Davis  Senior Vice President and Chief Nuclear  Officer  Detroit Edison Company  Fermi 2 - 210 NOC  6400 North Dixie Highway  Newport, MI 48166</p>
<p>Fort Calhoun Station, Unit 1  Docket No. 50-285  License No. DPR-40</p>	<p>David J. Bannister  Vice President and CNO  Omaha Public Power District  Fort Calhoun Station  444 South 16<sup>th</sup> Street Mall  Omaha, NE 68102-2247</p>
<p>Grand Gulf Nuclear Station, Unit 1  Docket No. 50-416  License No. NPF-29</p>	<p>Marty L. Richey  Director, Nuclear Safety Assurance  Entergy Operations, Inc.  Grand Gulf Nuclear Station  7003 Bald Hill Road  P. O. Box 756  Port Gibson, MS 39150</p>

<p>Hope Creek Generating Station  Docket No. 50-354  License No. NPF-57</p>	<p>Robert Braun  Senior Vice President - Nuclear  PSEG Nuclear LLC  P.O. Box 236, N09  Hancocks Bridge, NJ 08038</p>
<p>Salem Nuclear Generating Station,  Unit Nos. 1 and 2  Docket Nos. 50-272, 50-311  License Nos. DPR-70, DPR-75</p>	
<p>Indian Point Nuclear Generating,  Unit Nos. 2 and 3  Docket Nos. 50-247, 50-286  License Nos. DPR-26, DPR-64</p>	<p>Joseph Pollock  Site Vice President  Entergy Nuclear Operations Inc.  Indian Point Energy Center  450 Broadway, GSB  P.O. Box 249  Buchanan, NY 10511-0249</p>
<p>James A. FitzPatrick Nuclear Power Plant  Docket No. 50-333  License No. DPR-59</p>	<p>Kevin Bronson – Site Vice President  Entergy Nuclear Operations, Inc.  James A. FitzPatrick Nuclear Power  Plant  P.O. Box 110  Lycoming, NY 13093</p>
<p>Pilgrim Nuclear Power Station  Docket No. 50-293  License No. DPR-35</p>	<p>Robert Smith  Site Vice President  Entergy Nuclear Operations, Inc.  Pilgrim Nuclear Power Station  600 Rocky Hill Road  Plymouth, MA 02360-5508</p>
<p>Vermont Yankee Nuclear Power Station  Docket No. 50-271  License No. DPR-28</p>	<p>Michael J. Colomb  Site Vice President  Entergy Nuclear Operations, Inc.  Vermont Yankee Nuclear Power Station  320 Governor Hunt Road  Vernon, VT 05354</p>
<p>Kewaunee Power Station  Docket No. 50-305  License No. DPR-43</p>	<p>David A. Heacock  President and Chief Nuclear Officer  Dominion Nuclear  5000 Dominion Boulevard  Glen Allen, VA 23060-6711</p>
<p>Millstone Power Station, Unit Nos. 2 and 3  Docket Nos. 50-336, 50-423  License Nos. DPR-65, NPF-49</p>	
<p>North Anna Power Station, Units 1 and 2  Docket Nos. 50-338, 50-339  License Nos. NPF-4, NPF-7</p>	

<p>Surry Power Station, Units 1 and 2  Docket Nos. 50-280, 50-281  License Nos. DPR-32, DPR-37</p>	<p>David A. Heacock  President and Chief Nuclear Officer  Dominion Nuclear  5000 Dominion Boulevard  Glen Allen, VA 23060-6711</p>
<p>Monticello Nuclear Generating Plant, Unit No. 1  Docket No. 50-263  License No. DPR-22</p>	<p>James E. Molden  Vice President, Operations Support  Xcel Energy  414 Nicollet Mall - MP4  Minneapolis, MN 55401</p>
<p>Prairie Island Nuclear Generating Plant,  Units 1 and 2  Docket Nos. 50-282 &amp; 50-306  License Nos. DPR-42 &amp; DPR-60</p>	
<p>Palisades Nuclear Plant  Docket No. 50-255  License No. DPR-20</p>	<p>Vice President, Operations  Entergy Nuclear Operations, Inc.  Palisades Nuclear Plant  27780 Blue Star Memorial Highway  Covert, MI 49043-9530</p>
<p>Palo Verde Nuclear Generating Station,  Units 1, 2 and 3  Docket Nos. STN 50-528, STN 50-529,  &amp; STN-50-530  License Nos. NPF-41, NPF-51, &amp; NPF-74</p>	<p>John H. Hesser  Vice President  Nuclear Engineering and Support  Palo Verde Nuclear Generating Station  Mail Station 7605  Arizona Public Service Company  P. O. Box 52034  Phoenix, AZ 85072-2034</p>
<p>Perry Nuclear Power Plant, Unit No. 1  Docket No. 50-440  License No. NPF-58</p>	<p>Mark Bezilla  Vice President  FirstEnergy Nuclear Operating Company  Mail Stop: A-PY-A290  10 Center Road  Perry, OH 44081-0097</p>
<p>Point Beach Nuclear Plant, Units 1 and 2  Docket Nos. 50-266 &amp; 50-301  License Nos. DPR-24 &amp; DPR-27</p>	<p>Larry Meyer  Site Vice President  NextEra Energy Point Beach, LLC  Point Beach Nuclear Plant  6610 Nuclear Road  Two Rivers, WI 54241-9516</p>

<p>River Bend Station, Unit 1  Docket No. 50-458  License No. NPF-47</p>	<p>Michael Perito  Vice President, Operations  Entergy Operations, Inc.  River Bend Station  5485 US Highway 61N  St. Francisville, LA 70775</p>
<p>San Onofre Nuclear Generating Station,  Units 2 and 3  Docket Nos. 50-361 &amp; 50-362  License Nos. NPF-10 &amp; NPF-15</p>	<p>D. Bauder  Senior Vice President and  Chief Nuclear Officer  Southern California Edison Company  San Onofre Nuclear Generating Station  Mail Stop D45  P. O. Box 128  San Clemente, CA 92674-0128</p>
<p>Seabrook Station, Unit 1  Docket No. 50-443  License No. NPF-86</p>	<p>Paul Freeman  Site Vice President  Seabrook Station  NextEra Energy Seabrook, LLC  P. O. Box 300  Seabrook, NH 03874</p>
<p>South Texas Project, Units 1 and 2  Docket Nos. 50-498 &amp; 50-499  License Nos. NPF-76 &amp; NPF-80</p>	<p>Edward D. Halpin  President and Chief Executive Office  STP Nuclear Operating Company  South Texas Project  P. O. Box 289  Wadsworth, TX 77483</p>
<p>St. Lucie Nuclear Plant, Units 1 and 2  Docket Nos. 50-335, 50-389  License Nos. DPR-67, NPF-16</p>	<p>Mano Nazar  Senior Vice President, Nuclear  and Chief Nuclear Officer  Florida Power and Light Company  P. O. Box 14000  Juno Beach, FL 33408-0420</p>
<p>Turkey Point Nuclear Plant, Units 3 and 4  Docket Nos. 50-250, 50-251  License Nos. DPR-31, DPR-41</p>	<p>Mano Nazar  Executive Vice President and Chief  Nuclear Officer  Florida Power &amp; Light Company  P.O. Box 14000  Juno Beach, FL 33408-0420</p>
<p>Susquehanna Steam Electric Station,  Units 1 and 2  Docket Nos. 50-387 &amp; 50-388  License Nos. NPF-14 &amp; NPF-22</p>	<p>Timothy S. Rausch  Senior Vice President and Chief Nuclear  Officer  PPL Susquehanna, LLC  Mail Stop: NUCSB3  769 Salem Boulevard  Berwick, PA 18603</p>

<p>Virgil C. Summer Nuclear Station  Docket No. 50-395  License No. NPF-12</p>	<p>Thomas D. Gatlin  Vice President, Nuclear Operations  South Carolina Electric and Gas  Company  Virgil C. Summer Nuclear Station  P. O. Box 88  Jenkinsville, SC 29065</p>
<p>Waterford Steam Electric Station, Unit 3  Docket No. 50-382  License No. NPF-38</p>	<p>Joseph A. Kowalewski  Vice President, Operations  Entergy Operations, Inc.  Waterford Steam Electric Station, Unit 3  17265 River Road  Killona, LA 70057-3093</p>
<p>Wolf Creek Generating Station, Unit 1  Docket No. 50-482  License No. NPF-42</p>	<p>Stephen E. Hedges  Site Vice President  Wolf Creek Nuclear Operating  Corporation  P. O. Box 411  Burlington, KS 66839</p>



Letter to Holders of Licenses for Operating Power Reactors dated

SUBJECT: CYBER SECURITY PLAN IMPLEMENTATION SCHEDULE

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		RidsNrrPMSummer Resource	
		RidsNrrPMWaterford Resource	
		RidsNrrPMWolfCreek Resource	

Please contact your Licensing Project Manager if you have any questions.

Sincerely,

*/RA/*

Robert J. Pascarelli, Chief  
Plant Licensing Branch III-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

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

May 13, 2011

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

SUBJECT: MILLSTONE POWER STATION – NRC TEMPORARY INSTRUCTION 2515/183  
INSPECTION REPORT 05000245/2011009, 05000336/2011009, AND  
05000423/2011009

Dear Mr. Heacock:

On April 28, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Millstone Power Station, using Temporary Instruction 2515/183, "Followup to the Fukushima Daiichi Nuclear Station Fuel Damage Event." The enclosed inspection report documents the inspection results which were discussed on April 28, 2011, with Mr. Richard McManus and other members of your staff.

The objective of this inspection was to promptly assess the capabilities of Millstone Power Station to respond to extraordinary consequences similar to those that have recently occurred at the Japanese Fukushima Daiichi Nuclear Station. The results from this inspection, along with the results from this inspection performed at other operating commercial nuclear plants in the United States will be used to evaluate the United States nuclear industry's readiness to safely respond to similar events. These results will also help the NRC to determine if additional regulatory actions are warranted.

All of the potential issues and observations identified by this inspection are contained in this report. The NRC's Reactor Oversight Process will further evaluate any issues to determine if they are regulatory findings or violations. Any resulting findings or violations will be documented by the NRC in a separate report. You are not required to respond to this letter.

D. Heacock

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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 will be made 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), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

A handwritten signature in black ink, appearing to read "Lawrence T. Doerflein". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Lawrence T. Doerflein, Chief  
Engineering Branch 2  
Division of Reactor Safety

Docket Nos.: 50-245, 50-336, 50-423,  
License Nos.: DPR-21, DPR-65, NPF-49

Enclosure: Inspection Reports 05000245/2011009, 05000336/2011009, and  
05000423/2011009

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D. Heacock

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Sincerely,

*/RA/*

Lawrence T. Doerflein, Chief  
Engineering Branch 2  
Division of Reactor Safety

Docket Nos.: 50-245, 50-336, 50-423,  
License Nos.: DPR-21, DPR-65, NPF-49

Enclosure: Inspection Reports 05000245/2011009, 05000336/2011009, and  
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U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos: 50-245, 50-336, 50-423,

License Nos: DPR-21, DPR-65, NPF-49

Report No: 05000245/2011009, 05000336/2011009, and 05000423/2011009

Licensee: Dominion Nuclear Connecticut, Inc.

Facility: Millstone Power Station, Units 1, 2, and 3

Location: P.O. Box 128  
Waterford, CT 06385

Dates: April 1, 2011 through April 28 2011

Inspectors: S. Shaffer, Senior Resident Inspector, Millstone Power Station  
Kevin Mangan, Senior Reactor Inspector, Division of Reactor Safety  
J. Krafty, Resident Inspector, Millstone Power Station  
B. Haagensen, Resident Inspector, Millstone Power Station

Approved by: Lawrence T. Doerflein, Chief  
Engineering Branch 2  
Division of Reactor Safety

## **SUMMARY OF FINDINGS**

IR 05000245/2011009, 05000336/2011009, and 05000423/2011009; 04/01/2011 – 04/29/2011; Millstone Power Station, Units 1, 2 and 3; Temporary Instruction 2515/183 - Followup to the Fukushima Daiichi Nuclear Station Fuel Damage Event.

This report covers an announced Temporary Instruction (TI) inspection. The inspection was conducted by three resident inspectors and a region based inspector. 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.

## **INSPECTION SCOPE**

The intent of the TI is to provide a broad overview of the industry's preparedness for events that may exceed the current design basis for a plant. The focus of the TI was on (1) assessing the licensee's capability to mitigate consequences from large fires or explosions on site, (2) assessing the licensee's capability to mitigate station blackout (SBO) conditions, (3) assessing the licensee's capability to mitigate internal and external flooding events accounted for by the station's design, and (4) assessing the thoroughness of the licensee's walkdowns and inspections of important equipment needed to mitigate fire and flood events to identify the potential that the equipment's function could be lost during seismic events possible for the site. If necessary, a more specific followup inspection will be performed at a later date.

## **INSPECTION RESULTS**

All of the potential issues and observations identified by this inspection are contained in this report. The NRC's Reactor Oversight Process will further evaluate any issues to determine if they are regulatory findings or violations. Any resulting findings or violations will be documented by the NRC in a separate report.



03.01 Assess the licensee's capability to mitigate conditions that result from beyond design basis events, typically bounded by security threats, committed to as part of NRC Security Order Section B.5.b issued February 25, 2002, and severe accident management guidelines and as required by Title 10 of the Code of Federal Regulations (10 CFR) 50.54(hh). Use Inspection Procedure (IP) 71111.05T, "Fire Protection (Triennial)," Section 02.03 and 03.03 as a guideline. If IP 71111.05T was recently performed at the facility the inspector should review the inspection results and findings to identify any other potential areas of inspection. Particular emphasis should be placed on strategies related to the spent fuel pool. The inspection should include, but not be limited to, an assessment of any licensee actions to:

Licensee Action	Describe what the licensee did to test or inspect equipment.
<p>a. Verify through test or inspection that equipment is available and functional. Active equipment shall be tested and passive equipment shall be walked down and inspected. It is not expected that permanently installed equipment that is tested under an existing regulatory testing program be retested.</p> <p>This review should be done for a reasonable sample of mitigating strategies/equipment.</p>	<p>Licensee actions included the identification of equipment (active and passive) utilized for implementation of B.5.b actions and any additional equipment used in Severe Accident Management Guidelines (SAMG). The scope of the equipment was defined as that equipment specifically designated for B.5.b or SAMG mitigation (i.e., special hoses, fittings, diesel fire pump, etc.). Permanent plant equipment (i.e., in situ equipment) was not considered in the scope, since it is normally in service, subjected to planned maintenance, and/or checked on operator rounds. The licensee then identified surveillances/tests and performance frequencies for the identified equipment, and reviewed the results of recent tests. Active equipment within the scope defined above that did not have recent test results was tested. Passive equipment within the scope was walked down and inspected.</p> <p>Describe inspector actions taken to confirm equipment readiness (e.g., observed a test, reviewed test results, discussed actions, reviewed records, etc.).</p>

	<p>The inspectors assessed the licensee's capabilities by conducting a review of the licensee's walkdown activities. In addition, the inspectors independently walked down and inspected all major B.5.b contingency response equipment staged throughout the site. The results of the inspectors' independent walkdowns confirmed the results obtained by the licensee.</p> <p>The inspectors determined that the B.5.b strategy was not required to be applied to the Unit 1 spent fuel pool. However, the inspector reviewed procedures developed by the licensee to respond to a B.5.b type event. Additionally the inspector walked down the spent fuel pool and the paths where mitigating equipment would be employed. Documents reviewed by the inspectors are listed in the Supplemental Information Attachment to this report.</p>
	<p>Discuss general results including corrective actions by licensee.</p>
	<p>All equipment (active and passive) designated for B.5.b was verified by the licensee to be in applicable procedures. All passive equipment was walked down and verified to be in place and ready for use. Passive equipment which had surveillance and/or preventative maintenance tasks had those activities performed to verify readiness for use.</p> <p>All active equipment located at the site was verified in place by the licensee. Dominion retested selected active equipment on site. Equipment was verified to be within the required surveillance test interval.</p> <p>Based on the results of the licensee reviews and their own walkdowns, the inspectors concluded that the required equipment is available and functional.</p>

Licensee Action	Describe the licensee's actions to verify that procedures are in place and can be executed (e.g. walkdowns, demonstrations, tests, etc.).
<p>b. Verify through walkdowns or demonstration that procedures to implement the strategies associated with B.5.b and 10 CFR 50.54(hh) are in place and are executable. Licensees may choose not to connect or operate permanently installed equipment during this verification.</p> <p>This review should be done for a reasonable sample of mitigating strategies/equipment.</p>	<p>Licensee actions included the identification of those procedures utilized to mitigate the consequences of a B.5.b related event and severe accidents. Dominion then compiled verification documentation for procedure validations and identified any procedures not issued or validated and any with open change requests. Open change requests were reviewed for potential impacts on procedure functionality. Licensee personnel were then dispatched to walk down all applicable procedures to verify the ability of the procedures to be executed.</p>
	<p>Describe inspector actions and the sample strategies reviewed. Assess whether procedures were in place and could be used as intended.</p>
	<p>The inspectors assessed the licensee's capabilities by conducting a review of the licensee's walkdown activities. In addition, the inspectors selected several sections of a sample of the procedures walked down by the licensee and walked those down to independently verify the licensee's conclusions. Documents reviewed by the inspectors are listed in the Supplemental Information Attachment.</p>
	<p>Discuss general results including corrective actions by licensee.</p>

	<p>Dominion reviewed SAMG strategies and did not identify any issues. Procedures used for B.5.b were reviewed by the licensee and walkdowns were performed by operators to ensure actions taken in the field in response to a B.5.b event could be performed. Open procedure change requests were reviewed by the licensee to verify there were no immediate procedure changes required. Some minor enhancements were identified by the licensee and entered into the Corrective Action Program (CAP).</p> <p>The inspectors identified an enhancement associated with the positioning of the Unit 1 spent fuel pool crane. The licensee entered the issue into the corrective action program (CR 422447).</p> <p>Based on the results of their reviews the inspectors concluded that that procedures to implement the strategies associated with B.5.b and 10 CFR 50.54(hh) are in place and are executable.</p>
<p>Licensee Action</p>	<p>Describe the licensee's actions and conclusions regarding training and qualifications of operators and support staff.</p>
<p>c. Verify the training and qualifications of operators and the support staff needed to implement the procedures and work instructions are current for activities related to Security Order Section B.5.b and severe accident management guidelines as required by 10 CFR 50.54 (hh).</p>	<p>Licensee actions included the identification of training/qualification requirements for operators for the implementation of actions needed to mitigate a B.5.b related event, and for the implementation of actions needed for the SAMG. The licensee documented that operator training requirements were current, and identified those operators with qualification requirements that were not current. The number of individual with non-current qualifications was small and mainly associated with individuals still in the initial training phase of their qualifications. In addition, the licensee identified the training/qualification requirements for applicable emergency response organization (ERO) command and support staff for the implementation of actions needed to mitigate a B.5.b related event, and for the implementation of actions needed for the SAMGs, and documented that ERO command and support staff training requirements were current. Where applicable, those ERO command and support staff with qualification requirements that were not current were identified.</p> <p>Describe inspector actions and the sample strategies reviewed to assess training and qualifications of operators and support staff.</p>

	<p>The inspectors assessed the licensee's training and qualification activities by conducting a review of training and qualification materials and records related to B.5.b and SAMG event response.</p> <p>Based on the reviews completed, the inspectors concluded that the training and qualifications of operators and the support staff needed to implement the procedures and work instructions are current for activities related to Security Order Section B.5.b and severe accident management guidelines as required by 10 CFR 50.54 (hh).</p> <p>Documents reviewed by the inspectors are listed in the Supplemental Information Attachment.</p> <p>Discuss general results including corrective actions by licensee.</p> <p>The training requirements, qualifications, and associated records needed for operators for the implementation of SAMGs and B.5.b event response were reviewed by the licensee. Training was identified for shift managers, shift engineers, and unit supervisors, and verified that the training requirements were embedded within the position qualifications for the operators. Dominion confirmed that all shift operators verify their qualifications prior to assuming a shift position. The training requirements, qualifications, and associated records needed for ERO command and support staff for the implementation of actions needed to mitigate a B.5.b event or implement the SAMGs were also reviewed. All ERO command and support staff training requirements were verified as current by the licensee.</p> <p>Based on the reviews conducted, the inspectors concluded that the training and qualifications of operators and the support staff needed to implement the procedures and work instructions are current for activities related to Security Order Section B.5.b and SAMGs as required by 10 CFR 50.54 (hh).</p>
Licensee Action	Describe the licensee's actions and conclusions regarding applicable agreements and contracts are in place.

<p>d. Verify that any applicable agreements and contracts are in place and are capable of meeting the conditions needed to mitigate the consequences of these events.</p> <p>This review should be done for a reasonable sample of mitigating strategies/equipment.</p>	<p>Licensee actions included the identification of all 16 applicable agreements committed to be in place for offsite support for the emergency plan, including equipment and services to mitigate a B.5.b related event. The licensee verified that the agreements were current, and documented whether or not the required offsite equipment and services were available.</p>
	<p>For a sample of mitigating strategies involving contracts or agreements with offsite entities, describe inspector actions to confirm agreements and contracts are in place and current (e.g., confirm that offsite fire assistance agreement is in place and current).</p>
	<p>The inspectors assessed the licensee's capabilities by conducting an independent review of the licensee's emergency response agreements with the Town of Waterford Town Fire Commission, and Electric Boat Corporation. The inspectors' review of the agreements verified that they were current, and assessed whether or not they were adequate for meeting the licensee's mitigation strategy.</p> <p>Documents reviewed by the inspectors are listed in the Supplemental Information Attachment.</p>
	<p>Discuss general results including corrective actions by licensee.</p>
	<p>Dominion reviewed their letter of agreement with the Town of Waterford Fire Commission. The letter of agreement was last revised in November 2008. The Fire Chief was contacted by the licensee as part of their review efforts to ensure that the letter of agreement was still in effect and that no changes were necessary. The Fire Chief confirmed the status of the letter of agreement. In addition, the licensee also verified the list of available vendors for portable pumps and generators had changed. During the course of their review, the licensee updated their offsite vendor list.</p> <p>Based on their review, the inspectors concluded that applicable agreements and contracts are in place and are capable of meeting the conditions needed to mitigate the consequences of these events.</p>

<p>Licensee Action</p>	<p>Document the corrective action report number and briefly summarize problems noted by the licensee that have significant potential to prevent the success of any existing mitigating strategy.</p>
<p>e. Review any open corrective action documents to assess problems with mitigating strategy implementation identified by the licensee. Assess the impact of the problem on the mitigating capability and the remaining capability that is not impacted.</p>	<p>The inspectors reviewed each condition report (CR) listed in the Supplemental Information for potential impact to the licensee's mitigation strategies. No significant impacts were identified.</p>

03.02 Assess the licensee's capability to mitigate station blackout (SBO) conditions, as required by 10 CFR 50.63, "Loss of All Alternating Current Power," and station design, is functional and valid. Refer to TI 2515/120, "Inspection of Implementation of Station Blackout Rule Multi-Plant Action Item A-22" as a guideline. It is not intended that TI 2515/120 be completely reinspected. The inspection should include, but not be limited to, an assessment of any licensee actions to:

Licensee Action	Describe the licensee's actions to verify the adequacy of equipment needed to mitigate an SBO event.
<p>a. Verify through walkdowns and inspection that all required materials are adequate and properly staged, tested, and maintained.</p>	<p>Dominion actions included the identification of equipment utilized/required for mitigation of a SBO. Dominion conducted walkdowns of this equipment to ensure they were adequate and properly staged. Additionally, the licensee conducted a review of open CRs for potential SBO impact.</p>
	<p>Describe inspector actions to verify equipment is available and useable.</p>
	<p>The inspectors assessed the licensee's capability to mitigate SBO conditions by conducting a review of Dominion's walkdown activities. In addition, the inspectors selected a sample of equipment utilized/required for mitigation of a SBO and conducted independent walkdowns of that equipment to ensure that it was properly aligned and staged. The sample of equipment selected by the inspectors included, but was not limited to, the SBO diesel generator and its auxiliaries. Documents reviewed by the inspectors are listed in the Supplemental Information Attachment.</p>
	<p>Discuss general results including corrective actions by licensee.</p>
	<p>In general, Dominion's reviews verified that SBO equipment was ready to respond to a SBO condition. The licensee identified a number of enhancements during their review and these were entered in to their corrective action program. The CRs are listed in the Supplemental Information Attachment.</p> <p>Based on the their reviews, the inspectors concluded that the required equipment was properly staged, tested and maintained.</p>



Licensee Action	Describe the licensee's actions to verify the capability to mitigate an SBO event.
<p>b. Demonstrate through walkdowns that procedures for response to an SBO are executable.</p>	<p>Dominion actions included the identification of procedures required for response to a SBO, along with verification that the identified procedures were current and that no critical revision requests were in progress. Dominion verified that the mitigating procedures had been properly validated. Additionally, Dominion conducted a review of their corrective action program for any condition reports which had the potential to impact the SBO procedures.</p>
	<p>Describe inspector actions to assess whether procedures were in place and could be used as intended.</p>
	<p>The inspectors assessed the licensee's capabilities by conducting a review of Dominion's validation activities. In addition, the inspectors selected several sections of a sample of SBO procedures and walked those down with a Dominion senior reactor operator to independently verify the licensee's conclusions.</p> <p>Documents reviewed by the inspectors are listed in the Supplemental Information Attachment.</p>
	<p>Discuss general results including corrective actions by licensee.</p>
	<p>The Dominion procedures utilized to respond to a SBO are within the site's emergency operating procedures (EOP). Actions to start the SBO diesel generator and supply power to site essential loads are performed from permanently installed equipment in the plant. For purposes of this requirement, the licensee credited their original validation of the specific EOPs by a crew of licensed operators prior to the implementation of the current revision. No current issues were identified by the licensee. Based on the activities discussed above, the inspectors concluded that the procedures for responding to an SBO were executable.</p>

03.03 Assess the licensee's capability to mitigate internal and external flooding events required by station design. Refer to IP 71111.01, "Adverse Weather Protection," Section 02.04, "Evaluate Readiness to Cope with External Flooding" as a guideline. The inspection should include, but not be limited to, an assessment of any licensee actions to verify through walkdowns and inspections that all required materials and equipment are adequate and properly staged. These walkdowns and inspections shall include verification that accessible doors, barriers, and penetration seals are functional.

<p>Licensee Action</p>	<p>Describe the licensee's actions to verify the capability to mitigate existing design basis flooding events.</p>
<p>a. Verify through walkdowns and inspection that all required materials are adequate and properly staged, tested, and maintained.</p>	<p>Dominion walked through their abnormal operating procedures dealing with internal and external flooding to verify that the procedures could be completed as written. Watertight doors and flood gates were checked to ensure they were functional. Dominion performed walkdowns of flood protection equipment to ensure that it was properly staged.</p>
	<p>Describe inspector actions to verify equipment is available and useable. Assess whether procedures were in place and could be used as intended.</p>
	<p>The inspectors assessed Dominion's capabilities to mitigate flooding by conducting a review of their walkdown activities. The reviews involved accompanying Dominion personnel during their walkdown and conducting independent walkdowns of the abnormal operating procedures and flood mitigation equipment. The inspectors' conclusions aligned with the results obtained by Dominion.</p> <p>Documents reviewed by the inspectors are listed in the Supplemental Information Attachment.</p>
	<p>Discuss general results including corrective actions by licensee.</p>

	<p>The inspectors concluded that all required materials are adequate and properly staged, tested, and maintained to respond to an internal or external flood within the Millstone design basis. While no operability or significant concerns were identified, Dominion identified a few minor deficiencies during their walkdowns and initiated CRs to address them. The CRs are listed in the Supplemental Information Attachment of this report. The inspector reviewed the associated CRs and determined that the licensee's initial responses, including their assessment and prioritization, were appropriate.</p>
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03.04 Assess the thoroughness of the licensee's walkdowns and inspections of important equipment needed to mitigate fire and flood events to identify the potential that the equipment's function could be lost during seismic events possible for the site. Assess the licensee's development of any new mitigating strategies for identified vulnerabilities (e.g., entered it in to the corrective action program and any immediate actions taken). As a minimum, the licensee should have performed walkdowns and inspections of important equipment (permanent and temporary) such as storage tanks, plant water intake structures, and fire and flood response equipment; and developed mitigating strategies to cope with the loss of that important function. Use IP 71111.21, "Component Design Basis Inspection," Appendix 3, "Component Walkdown Considerations," as a guideline to assess the thoroughness of the licensee's walkdowns and inspections.

<p>Licensee Action</p>	<p>Describe the licensee's actions to assess the potential impact of seismic events on the availability of equipment used in fire and flooding mitigation strategies.</p>
<p>a. Verify through walkdowns that all required materials are adequate and properly staged, tested, and maintained.</p>	<p>Dominion engineers walked down fire and flooding equipment to determine the impact of seismic events on station fire and flooding mitigation strategies. Dominion engineers examined equipment that is seismically qualified, seismically rugged, or vulnerable to seismic events. For the equipment that was vulnerable to seismic events, the engineers determined if there were mitigating strategies in place or that further evaluation was needed.</p>
	<p>Describe inspector actions to verify equipment is available and useable. Assess whether procedures were in place and could be used as intended.</p>

	<p>The inspectors conducted multiple walkdowns, both independently and in conjunction with licensee personnel, of important equipment needed to mitigate fire and flood events to identify the potential that the equipment's function could be lost during a seismic event. This equipment included, but was not limited to:</p> <ul style="list-style-type: none"><li>• all major B.5.b contingency response equipment staged throughout the site;</li><li>• the installed diesel and electric fire pumps and their controls; and</li><li>• watertight doors, flood doors, and flood protection equipment</li></ul> <p>Licensee flood and fire mitigation procedures were reviewed to verify usability. The results of the inspectors' reviews aligned with the licensee's conclusions that there were a number of seismic vulnerabilities that potentially need to be addressed, as described below. The inspectors determined that the licensee meets current licensing and design basis for B.5.b, fire protection, and flooding.</p> <p>Documents reviewed by the inspectors are listed in the Supplemental Information Attachment.</p> <p>Discuss general results including corrective actions by licensee. Briefly summarize any new mitigating strategies identified by the licensee as a result of their reviews.</p>
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As noted above, the inspectors determined that the licensee meets current licensing and design basis for B.5.b, fire protection, and flooding. "Seismically qualified" is defined as the structures, systems, and components (SSC) that have been formally qualified to function during and after a design basis earthquake. The licensee's reviews determined that non-safety related SSCs, in general, were not considered to be either seismically qualified or seismically rugged. The majority of room flood mitigation sump pumps and flooding detectors were not designed as seismically qualified and have not been evaluated as being seismically rugged. Similarly, the vast majority of the fire protection system, including both installed fire pumps, was not designed as seismically qualified and cannot be considered seismically rugged. Firefighting equipment staged to respond to B.5.b events was not stowed in seismically qualified buildings and locations, as a seismic event and B.5.b event were not assumed to occur coincidentally. Finally, the inspectors determined that the access pathways to the spent fuel pool island, although robustly designed, could not be verified to withstand seismic loading. The licensee entered these issues into a beyond design basis database for further evaluation.

Dominion's preliminary reviews identified instances where seismic event response capability could be enhanced. These included improving procedural guidance and reviewing the locations of portable equipment. Final resolution and/or mitigating strategies were still under evaluation at the close of this inspection.

The inspector determined that the Unit 1 fire main isolation valve would need to be operated to pressurize the fire main to mitigate a fire in Unit 1, but the valve would be under water (inaccessible) following a design basis flood event. This item required further evaluation and was documented in Dominion's CAP.

## Meetings

### 40A6 Exit Meeting

The inspector presented the inspections results for the Unit 1 spent fuel pool to Mr. R MacManus and other members of the licensee management on April 15, 2011. The inspectors presented the remaining inspection results to Mr. MacManus and other members of licensee management at the conclusion of the inspection on April 28, 2011. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

**SUPPLEMENTAL INFORMATION**

**KEY POINTS OF CONTACT**

Licensee

R. MacManus, Director of Safety and Licensing  
T. Cleary, Supervisor, Licensing  
B. Bartron, Supervisor Licensing  
T. Berger, Shift Manager Unit 3  
S. Baker, Former Shift Manager, Unit 2

**LIST OF DOCUMENTS REVIEWED**

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety but rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

**03.01 Assess the licensee's capability to mitigate conditions that result from beyond design basis events**

Procedures:

AOP 2578, Loss of Refuel Pool and Spent Fuel Pool Level, Rev.006-02  
EDMG 2.02 Att. 10, Spent Fuel Pool Mitigation Strategies, Rev. 006  
EDMG 2.02 Att. 8, Alternative Methods to Inject Into Containment, Rev. 006  
EOP 3505A, Loss of Spent Fuel Pool Cooling, Rev. 008-02  
SACGR-2, Severe Accident Control Room Guidelines for Transients after the TSC is Activated, Rev. 002  
SACGR-3, Severe Accident Control Room Guidelines for MP# B.5.b Initial Event Response (EDMG), Rev. 003  
SACRG-1, Severe Accident Control Room Guidelines Initial Response, Rev. 009  
SAG-9, App. B, Unit 3 RCS Cooldown, Rev. 011  
SAG-9, App. L, Unit 3 Filling Steam Generators through Blowdown Piping, Rev. 011  
SAG-9, Att. H, Unit 3 Alternate Methods to Inject into Containment, Rev. 011  
SAG-9, MP3 B.5.b Event TSC Response, Rev. 010  
SAMG 4212, Severe Accident Mitigation Guideline Phase 2, Verification of Diagnosis, Rev. 002  
SAMG 4213, Severe Accident Mitigation Guideline Phase 3, CHLA Implementation, Rev. 001

Condition Reports:

CR412308, EDMG 2.01 Needs Minor Enhancements  
CR417399, Procedure Enhancement for AOP-3570, Earthquake  
CR417954, Spare Appendix 'R' Service Water Motor Removed from Site without TRM Action  
CR418448, Corrections Required for SAG-4 Inject into Containment  
CR418450, Corrections Required for SAG-5 Reduce Fission Product Releases  
CR418451, Editorial Change to SCG-2 Depressurize Containment  
CR418452, Corrections required for SAG-8 Flood Containment  
CR418454, Editorial Changes to SCG-3 Control Hydrogen Flammability  
CR418455, Editorial Changes to SAG-1, Injection into the Steam Generators  
CR418456, Corrections Required for SACGR-1 Severe Accident CR Guidelines Initial Response  
CR418464, Corrections Required for CA-5 Containment Water Level and Volume  
CR418468, Changes Required for CA-1 RCS Injection to Recover Core  
CR418471, Changes Required for SACRG-2 Severe Accident CR Guideline for Transients  
CR418473, Corrections Required for SCG-1 Mitigate Fission Product Releases  
CR418512, Procedure Corrections Required for SCG-4 Control Containment Vacuum  
CR418550, Test Protected Area Lighting for Compliance with B.5.b Criteria  
CR418607, Rectifier for B.5.b Response Strategy Not Working  
CR418805, SAMG 4215 Att. 1 Refers to Hydrogen Recombiners  
CR418807, INPO Event Review 11-01 Issue, pH Buffer Control Post Severe Accident  
CR418825, SAMG 4213 Att. 4 Refers to Containment Annulus Gas Space  
CR418886, Enhancements to Security Procedures SCIP 14 and SCIP 15  
CR418982, Procedure SAG-9 has a Typographical Error  
CR419204, Alternative Cool Vests Should be Researched for Use in EDMG 2.02  
CR419213, EDMG 2.02 Att. 11 Requirement for Cutting into AB Roof  
CR419280, Need to Identify and Stage MT&E Identified in EDMG/SAMG Space  
CR419281, ECA-0.0 Attachment 1 Contains Typographical Error and Requires Revision  
CR419649, NRC Inspection Identifies Enhancements to Procedure SAG  
CR419952, IER 11-1 Walkdowns and Inspections  
CR419953, IER 11-1 Walkdowns and Inspections  
CR421310, SAMGs Need Enhancement  
CR421939, CR to Track IER 11-1 Enhancements  
CR424710, Spool Piece Lagging Identified in AG 4 and SAG 8 Needs Labeling  
CR442447, Control of Unit 1 Refuel Platform Position in SFP Needs Enhancement

Other:

99-ENG-01906-M1, Transient and Steady State Temperature of MP1 SFP and RB with no Active SFP Cooling, Rev. 0  
Dominion Fleet Response to IER L1 11-1, Fukushima Daiichi Nuclear Station Fuel Damage Caused by Earthquake and Tsunami, Attachment 2: Millstone Units 1, 2 and 3, 4/15/11  
Drill Form, B.5.b Spent Fuel Pool Drill Evaluation: Unit 2 External Water Supply  
Drill Form, B.5.b Spent Fuel Pool Drill Evaluation: Unit 3 External Water Supply  
Lesson Plan, MB-307, Unit 2 Severe Accident Mitigation Guidelines  
Lesson Plan, Unit 3 Severe Accident Mitigation Guidelines Overview



MB-010-010, Qualification Status: All Assignments/Nuclear Training Information Management System, 4/1/11

Memorandum, B.5.b Strategy Evaluations Millstone Unit 2, 8/11/08

Memorandum, B.5.b Strategy Evaluations Millstone Unit 3, 8/11/08

Memorandum, Revised Steam Generator Depressurization Evaluation B.5.b Strategy Evaluation MP2, 2/23/09

SP21, Unit 2 Appendix 'R' Fire Cage Inventory, Rev. 001-03

### **03.02 Assess the licensee's capability to mitigate station blackout (SBO) conditions**

#### Procedures:

EOP 2530, Station Blackout, Rev. 011-02

EOP 2541, Appendix I, Millstone Unit 2 Diagnostic Flowchart, Rev. 001

EOP 35 ECA-0.0, Loss of all AC Power, Rev. 022-02

ONP 540F, Loss of Normal Power, Rev. 002-02

OP 3346D, Station Blackout Diesel, Rev. 011-09

#### Condition Reports:

CR410806, Insufficient Level of Detail for SBO Use in MP2 Procedures

CR418703, Procedure Change Needed to OP 3346D, Station Blackout Diesel

CR418706, Procedure Change Needed to OP 3346D, Station Blackout Diesel

CR419309, AOP 3577 Refers to TRM 7.4.1 for ACTIONS Only for 'A' Train Components

CR421662, Procedural enhancements to ONP 540F, Loss of Normal Power

CR421664, Procedural Improvements for AOP 2583, Loss of all AC Power during Shutdown Conditions

#### Other:

WO 53102370098

WO 53102382634

WO 53102393827

### **03.03 Assess the licensee's capability to mitigate internal and external flooding events required by station design**

#### Procedures:

AOP 2560, Storms, High Winds and High Tides, Rev. 010-05

AOP 3569, Severe Weather Conditions, Rev. 016-00

#### Condition Reports:

CR417719, Emergency Addition of Fuel Oil to Unit 2 EDG Compromised

CR418059, No Steps to Fill EDG Supply Tanks if EDG Fuel Oil Storage Tank not Available

CR418749, Not Enough Qualified Electricians to Protect SW Pump in a Flood

CR419539, Gap in East Switchgear Room Door (C-4-1A) when Closed

CR419952, Support Missing from Conduit for Load Center 32D  
CR419953, Degraded Restraint for Manway Cover for 3EMH\*4  
CR4200238, Storage of Unit 1 Temporary Diesel  
CR420060, Safety Line not Staged  
CR420065, Procedure Enhancement for MP2721C  
CR420106, Fire Pump House Floor Drain Plug Cannot be Installed Due to Welded Drain Screen  
CR420239, Procedure Enhancement for AOP 2560  
CR420495, 2" Floor Penetration to TDAFW Pump Room Missing 4" Flood Protection Sleeve

**03.04 Assess the thoroughness of the licensee's walkdowns and inspections of important equipment needed to mitigate fire and flood events to identify the potential that the equipment's function could be lost during seismic events**

Procedures:

AOP 2559, Fire, Rev. 008  
AOP 2562, Earthquake, Rev. 006-04  
AOP 3570, Earthquake, Rev. 013-01  
EOP 3509, Fire Emergency, Rev. 024-02  
ONP 505, Fire, Rev. 006-02  
ONP 514C, Earthquake, Rev. 005-02  
ONP 532, Loss of Spent Fuel Pool Cooling, Rev. 005-07  
SFP 31, Fire Water System Back-up Supply Plan, Rev. 004-03

Calculations/Evaluations:

MP1SFP-040001F1, Millstone 1 Spent Fuel Pool no Boraflex Credit, Rev. 0  
MP1SFP-01976F1, Millstone 1 Spent Fuel Pool Criticality Analysis Documentation, Rev. 1

Condition Reports:

CR420776, Procedure Enhancement to AOP 2562  
CR420797, Unit 2 Seismic Monitoring System Becoming Obsolete

Other:

Safety Evaluation, Millstone Nuclear Power Station, Unit 1 Modifications to Spent Fuel Storage Pool, 7/15/76

**LIST OF ACRONYMS USED**

ADAMS	Agencywide Documents Access and Management System
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CR	Condition Reports
DRP	Division of Reactor Projects
EOP	Emergency Operating Procedures
ERO	Emergency Response Organization
NRC	United States Nuclear Regulatory Commission
PARS	Publicly Available Records
SAMG	Severe Accident Management Guidelines
SBO	Station Blackout
SSC	Structures, Systems, and Components

# Bulletin of the CONNECTICUT ACADEMY OF SCIENCE AND ENGINEERING



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## The Future of Nuclear Power in Connecticut

[Editor's Note: Author Lee Langston is Professor Emeritus of Mechanical Engineering at the University of Connecticut and Chair of the CASE Nuclear Power Study Committee.]

Electric power provides the means to make modern civilization go. I've often thought that it is like your health: When you have it, you don't think about it. When you don't have it, that's all you think about.

At present, about 20% of US electricity is generated by 104 nuclear power plants across the country. The first, Shippingport Atomic Station, located on the Ohio River 25 miles from Pittsburgh, went online in 1957, and was followed by many more in the next twenty years. But up until last year, no new US nuclear plants had been licensed since the 1970s. The Southern Company is now building two nuclear units at the Vogtle site, where two nuclear units are already operating, on the Savannah River near Augusta, Georgia—the first newly licensed nuclear plants in the United States in over 30 years.

The use of nuclear power to generate electricity in Connecticut also has a long history. Connecticut Yankee, the first of four nuclear power plants in the state, was located at the confluence of the Connecticut and Salmon Rivers and began generating commercial electric power in 1968. In addition, the state has two nuclear plant manufacturers: General Electric Company, with headquarters in Fairfield, and Westinghouse Electric Company in Windsor.

Depending on the season and the time of day, Connecticut's electric power needs can be as high as 6,000-8,000 megawatts electric (MWe). The state's nuclear plants can supply roughly a third of these peak power needs. Nuclear plants run in a base load mode, essentially running continuously at full power, except to shut down every 18 months or so for refueling. According to the latest US Energy Information Administration (EIA) figures, in 2008 Connecticut's net electrical energy generation was 30,409 thousand megawatt hours—and 51% of that was from the state's nuclear plants. Connecticut is one of only six states where nuclear power is the primary means of electrical generation.

Because the contribution from nuclear plants is so important to the state's economy and well-being, last year the Connecticut Energy Advisory Board (CEAB) asked the Academy to conduct a study of Advances in Nuclear Power Technologies. The resulting CASE Nuclear Power Study Committee (NPSC) was formed in July of last year with the goal of completing a report to the CEAB later this year on the latest technology, science, economics and environmental issues associated with nuclear power, to aid in planning for

(See *Nuclear Power*, page 2)

## Nuclear Power Expert Matzie to Address CASE Meeting



Dr. Regis Matzie will review the status of nuclear power at CASE's May 25 meeting.

As keynote speaker at the CASE Annual Meeting and Dinner (to be held May 25, 2011 at the Stepping Stones Museum in Norwalk), CASE member Regis A. Matzie will review the current status of nuclear power in the United States, some of the features of advanced light water reactors (ALWRs) that are being built today, and unique aspects of small modular reactors (SMRs) that are now being developed and may be in Connecticut's energy future.

Matzie recently retired as Senior Vice President and Chief Technology Officer from the Westinghouse Electric Company, one of the world's largest and oldest nuclear power plant manufacturers. He was responsible for all Westinghouse research and development undertakings and advanced nuclear plant development. Earlier, Matzie was vice president of Nuclear Systems for ABB Combustion Engineering Nuclear Power in Windsor, Connecticut, which was purchased by Westinghouse.

## News from the National Academies

The following is excerpted from press releases and other news reports from the National Academies ([www.national-academies.org](http://www.national-academies.org)).

### ◆ Latest Dietary Guidelines for Americans Released

The US departments of Agriculture and Health and Human Services have released the *2010 Dietary Guidelines for Americans*, the government's nutritional guidance to promote health, reduce the risk of chronic diseases, and reduce the prevalence of obesity through improved nutrition and physical activity. The committee that developed the guidelines considered several sources of evidence and expertise, including reports from the Institute of Medicine.

The new guidelines encourage Americans to eat more fruits, vegetables, whole grains, and seafood. They also place greater emphasis on salt reduction for several population groups, and more strongly urge people to watch their calorie intakes and increase their physical activity. IOM has issued several reports that take on chronic disease, obesity, and other nutrition-related dangers. The Dietary Guidelines aid policymakers in designing and implementing nutrition-related programs. They also provide education and health professionals, such as nutritionists, dietitians, and health educators, with a compilation of the latest science-based recommendations. A table with key consumer behaviors and potential strategies for professionals to use in implementing the Dietary Guidelines is included in the appendix.

<http://www.dietaryguidelines.gov>

### ◆ USDA Proposes Changes to Foods in School Meals Program

For the first time in 15 years, the US Department of Agriculture has proposed changes to the amounts and types of foods served in the federal school meals program. The new standards would increase the amounts and varieties of fruits, vegeta-

(See *National Academies*, page 7)

future electrical power needs of the state. The committee consists of 20 experts from various disciplines. I am the committee chair and Regis Matzie, retired Senior Vice President of Westinghouse Electric Company, is one of the nuclear industry experts serving on the NPSC. Matzie is an Academy member and will be the featured keynote speaker (see page 1), on nuclear energy at the Academy's May 25, 2011 Annual Meeting and Dinner at the Stepping Stones Museum for Children in Norwalk.

The need to be aware of progress in nuclear power is a strong one, not only because of the state's dependence on this energy converter for one half of its electricity, but also because of the public clamor for power conversion processes that don't produce CO<sub>2</sub> and other greenhouse gases. It was only 16 years ago that the state had four nuclear power plants in operation: Connecticut Yankee at Haddam Neck, and Millstone Units 1, 2 and 3 in Waterford—the largest concentration in New England. Currently, the state has only two operating nuclear power plants, Millstone's Units 2 and 3, with the other two plants shut down, having come to the end of their service lives.

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Connecticut Yankee, with a nominal electrical output of 600 MWe, was retired in 1996, after a service life of 29 years and after producing over 110 billion kilowatt-hours from its uranium fuel. Millstone Unit 1, at the site of so-named granite quarry on Long Island Sound near Niantic, came on line in 1970 and ceased its 660 MWe output on retirement in 1998. This leaves Connecticut with Millstone's Unit 2 and Unit 3 which have a combined electrical output of 2,024 MWe. Unit 2 is licensed to operate until 2035, and Unit 3 until 2045.

Thus, three reasons why Connecticut should plan for future nuclear power plants include the following:

- They have a 43-year history of successful service in the state—a state that has very limited natural energy resources.
- Two of our four nuclear power plants, having reached the end of their design life cycle, have ceased operation.
- It can take a decade (or more) to have a new nuclear power plant conceived, permitted and constructed.

### *Some CASE NPSC Data*

Last year, at the start of the CASE study, the committee commissioned the Connecticut Economic Resource Center (CERC) to conduct a survey to assess the state residents' opinion of nuclear power. The results of a phone survey of 600 residents evenly distributed across the state showed the following:

- The majority (69%) thought that fossil fuels accounted for most of the electricity generated in the state. Only 12% picked nuclear, exceeded by 18% who either didn't know or were not sure how generation occurred, while a remaining 1% avowed renewables.
- Only about 50% knew there were operating nuclear plants in Connecticut and of these, 54% identified Waterford, Millstone or Niantic as the location.
- Respondents favored the use of green/renewable energy over the use of fossil fuels and nuclear power to produce electricity.
- While the majority of respondents believed that Connecticut should reduce its dependence on fossil fuels, in answer to whether the state should build a new nuclear power plant facility to reduce fossil fuel use and address climate change issues, 64% said no, 21% didn't know or weren't sure and 15% said yes.

The above are just a sampling of the nuclear power survey results. To me, one clear finding is the lack of knowledge our state residents have about nuclear power—and on energy matters in general. I remember the answer a French official gave to a question of why the French people didn't follow other European populations after the 1989 Chernobyl disaster and demand an end to France's extensive nuclear power program (which currently provides about 80% of their electrical power). His answer: "Twenty years of public education on nuclear energy." The survey strongly indicates that Connecticut's public needs a basic understanding of energy to make informed choices.

On September 24, 2010, members of the CASE committee toured the site of the decommissioned Connecticut Yankee (CY) nuclear power plant, located on 600 acres in Haddam Neck.

We walked on the actual site of the CY nuclear plant, which was decommissioned from 1998-2007 with all structures removed from 3-4 feet below ground level. It is now a fairly level field, with a low mound where the pressurized water reactor building sat.

*(See Nuclear Power, page 8)*

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### Biomedical Research

**KEY STEM CELL DISCOVERY.** Researchers from the **University of Connecticut** and **Yale University** discovered that Lin28, a key gene in stem cell development, also markedly enhances the growth and survival of human embryonic stem cells (*Stem Cells*, March)—a significant finding made possible by funding from the state's stem cell research program. The research team found that Lin28 activates targeted groups of genetic molecules found within a class of molecules called messenger RNAs in order to create proteins that are crucial in maintaining stem cell function and survival. Researchers said the finding could lead to new insights into how stem cells regenerate or repair damaged tissue in a host of diseases.

**SCIENTISTS SYNTHESIZE SOUGHT-AFTER ANTI-CANCER AGENT.** A **Yale University** team led by Assistant Professor of Chemistry **Seth Herzon** synthesized for the first time a chemical compound called lomaiviticin aglycon, leading to the development of a new class of molecules that appear to target and destroy cancer stem cells (*Journal of the American Chemical Society* online.) Until now, scientists had been unable to obtain significant quantities of the compound, which was originally discovered in 2001 and is produced by a rare marine bacterium that cannot be easily coaxed into creating the molecule. Herzon's team was able to synthesize the molecule in 11 steps starting from basic chemical building blocks.

**YALE BIODESIGN INSTITUTE LAUNCHED.** **Yale University** announced the creation of a Biodesign Institute that will leverage expertise of biologists, engineers and researchers in other disciplines to explore how living and material systems operate at the nanoscale. **James E. Rothman**, the Fergus F Wallace Professor of Biomedical Sciences and Chair of the Department of Cell Biology at **Yale School of Medicine**, has been named director and CASE member **T. Kyle Vanderlick**, Dean of the **Yale School of Engineering and Applied Science**, will serve as deputy director. A faculty advisory committee will help oversee the Institute, which is expected to open in early 2012.

**DENDRITIC CELLS AND LUPUS.** **Yale University** researchers reduced symptoms of lupus in mice by eliminating a key immune system cell, and in doing so may have identified a new therapeutic target for a variety of other autoimmune diseases (*Immunity*, Dec. 16). The research findings focus on the role the dendritic cell plays in systemic lupus erythematosus, or SLE. Dendritic cells are important for initiating the immune response to pathogens but it is unclear what role they play in autoimmune diseases such as SLE. The Yale team knocked out dendritic cells in lupus-prone mice and found a dramatic reduction in symptoms. They also discovered that knocking out the dendritic cells in lupus mice did not reduce the activation of pathogenic T cells as expected, which means dendritic cells might make a good therapeutic target for lupus and possibly other autoimmune diseases.



### Business & Industry

**PRATT, CT TO BENEFIT FROM BOEING CONTRACT AWARD.** On Feb. 24, the Pentagon announced that it has selected Boeing

to build the next generation of Air Force refueling tankers. The \$35 billion program is good news for **Pratt & Whitney**, which will assemble some 400 engines in Middletown, two for each of the 179 "NextGen Tanker" aircraft, plus spares. Boeing said the contract would support approximately 50,000 total US jobs with Boeing and more than 800 suppliers in more than 40 states.

**ALEXION BUYS CO FIRM FOR \$111M.** Cheshire drug maker **Alexion Pharmaceuticals Inc.** bought privately held biotechnology firm Taligen Therapeutics, of Aurora, CO, for \$111 million, to expand its product portfolio. Alexion's sole product, Soliris, treats a genetic blood disease called paroxysmal nocturnal hemoglobinuria.

**PRAXAIR TO SUPPLY CHINESE SOLAR MAKERS.** The **Praxair Electronics** division of Danbury-based **Praxair Inc.** entered into contracts with three Chinese solar fabricators to provide silane and other gases used to make photovoltaic panels. The Chinese companies are ShanXi LuAn Solar Energy (Changzhi, Shanxi Province); Changzhou Trina Solar Energy Co. Ltd (Jiangsu Province); and Realforce Solar (Jining, Shandong Province).

**KAMAN COMPLETES GLOBAL AEROSYSTEMS DEAL.** Bloomfield aircraft component manufacturer **Kaman Corp.** completed its purchase of Global Aerosystems LLC of Everett, WA, a firm that specializes in aircraft design and stress analysis. Terms were not disclosed. Global is an employee-owned firm with 120 aerospace engineers and revenues of \$20 million last year.

**GERBER SELLS LENS BUSINESS FOR \$21M.** **Gerber Scientific Inc.** in South Windsor sold its **Gerber Coburn** ophthalmic lens processing business to the newly formed, Connecticut-based company **Coburn Technologies Inc.** for \$21 million. Gerber said revenue from the sale would be used to repay debt and for general corporate purposes.

**ROGERS BUYS GERMAN FIRM.** Killingly manufacturer **Rogers Corp.** acquired Curamik Electronics GmbH, a German maker of power components for energy-efficient electric motors, for \$154 million cash. The purchase is in line with Rogers' strategy to refocus its product line on sustainable energy, Internet and mass-transit markets.



### Communication

**MXENERGY LAUNCHES CABLEVISION CHANNEL.** **MXEnergy**, a supplier of electricity and natural gas in Connecticut, launched **MXEnergyTV**, an on-demand TV channel found on Cablevision iO Channel 654. **MXEnergy** says it is "showcasing the people, places and products that are moving us forward, either through innovation or through environmental protection with energy saving tips." A multi-part series called **Attainable Sustainables** gives consumers simple tips for saving energy. Segments for the channel are filmed mostly in and around Connecticut.

**PRI ASSESSES CT E-GOVERNMENT.** A report by the **Legislative Program Review & Investigations (PRI) Committee** entitled *Assessment of Connecticut's Implementation of E-Government* ([http://www.cga.ct.gov/pri/2010\\_ACIEG.asp](http://www.cga.ct.gov/pri/2010_ACIEG.asp)) found that while

*Items that appear in the In Brief section are compiled from previously published sources including newspaper accounts and press releases. For more information about any In Brief item, please call the Academy at (860) 527-2161, write the editors at CASE Bulletin, 179 Allyn St., Suite 512, Hartford, CT 06103-1422, or email us at acad@ctcase.org*

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Connecticut has expanded its use of e-government, improvements tend to come from individual departments rather than being implemented systematically. The report's recommendations include the formation of a long-term e-government strategy to be guided by an e-government board and a director from within the Department of Information Technology.

### CT HOSPITALS ADOPT ELECTRONIC RECORD GUIDELINES

**EARLY.** Nearly half of Connecticut's nonprofit hospitals committed to early adoption of federal guidelines for digitizing patient health records ahead of a 2015 deadline, authorities say. Fourteen of the state's 29 nonprofit hospitals declared their intention to achieve "meaningful use" of electronic health records technology this year, which would certify them for incentive payments from Medicare and Medicaid. All US hospitals must make their patient records available electronically by 2015 or face federal fines.

**HBJ LAUNCHES NEW HEALTHCARE E-NEWSLETTER.** The *Hartford Business Journal* began publishing a weekly healthcare e-newsletter in February, replacing its weekly e-version of *Movers & Shakers*. HBJ newsman **Greg Bordonaro** heads the new online publication, entitled *HBJ Today*. Visit [www.hartfordbusiness.com](http://www.hartfordbusiness.com) for more information or to subscribe.



## Education & Cognition

**CCAT & DREAM IT. DO IT®.** The **Connecticut Center for Advanced Technology (CCAT)** will lead a Dream It. Do It ([www.ccat.us](http://www.ccat.us)) initiative in Connecticut to revitalize the state's workforce and economy. Developed by the Manufacturing Institute in 2005, Dream It. Do It® is a nationally recognized program that uses cutting-edge marketing to inform students, transitioning workers and military servicemen, and women about career opportunities in manufacturing and key sectors. Through mentoring in schools and community outreach, the program places students on educational pathways that result in an academic degree and a nationally portable, industry-recognized skill credential, according to CCAT.

**NEW NURSING SIMULATION LAB.** The **University of Connecticut's School of Nursing** opened a fourth medical simulation lab at UConn's Avery Point-Groton campus in connection with the debut of the nursing school's Masters Entry Into Nursing (MEIN) program. MEIN is designed for individuals who have a bachelor's degree in a non-nursing field to pursue a career in nursing. Offering the MEIN program in Groton enables students in eastern Connecticut to be trained locally rather than at UConn's campuses in Waterbury, Stamford or Storrs.



## Energy

**MALLOY PROPOSES AGENCY CONSOLIDATION.** Gov. **Dannel P. Malloy** proposed the creation of a newly consolidated **Department of Energy and Environmental Protection (DEEP)**, to be led by **Daniel C. Esty**, professor of environmental law and policy at **Yale** and a former US Environmental Protection Agency senior official. The DEEP would consolidate the **Department of Environmental Protection** and the **Department of Public Utility Control**, to allow for a more effective coordination of state energy and environmental policies. The governor's office said that the state's energy policy will become centralized in the agency through the creation of two new bureaus: the **Bureau of Utilities Control** and the **Bureau of**

**Energy Policy and Efficiency**, which will include staff transferred from the **Office of Policy and Management's Energy Management Unit**.

**COST OF TRANSMISSION PROJECTS.** Regional transmission organization **ISO-New England** determined that a portion of the cost of two transmission projects (out of four in Maine, Vermont and Southwest Connecticut) does not qualify for cost sharing and must be borne by Connecticut ratepayers. ISO stated that all of the Maine and Vermont projects were eligible for cost sharing (\$1.6 billion split among the six New England states). However, ISO said that \$56 million of the \$1.26-billion **Middleton-Norwalk Project** and \$38 million of the \$238-million **Glenbrook Cables Project** were local costs that must be taken on solely by Connecticut ratepayers, bringing to \$880 million the total amount that Connecticut will pay for all four projects.

### POWER DEALS:

- **UIL Holdings Corp.**, the parent company of **United Illuminating**, completed a \$1.3 billion acquisition of **Southern Connecticut Gas Co.**, the **Connecticut Natural Gas Corp.** and the Massachusetts-based Berkshire Gas Co. UIL acquired the companies from a subsidiary of Iberdrola SA for \$1.296 billion, less net debt of approximately \$331.1 million and a preliminary working capital adjustment of approximately \$47 million, resulting in cash consideration at closing of approximately \$917.9 million to Iberdrola.
- New England power generator EquiPower Resources Corp. will acquire **Milford Power** and its 548 MW combined-cycle gas turbine power plant. The purchase of the plant gives EquiPower 1,800 MW of capacity in New England.
- New England Power Generators Association (NEPGA), representing 85% of the region's power generators, filed with the Massachusetts Department of Public Utilities opposition to the proposed merger between Hartford-based **Northeast Utilities** and Boston-based NStar. In a statement, NEPGA said the merger as proposed will harm competitive energy markets in New England and roll back consumer protections and environmental benefits that have been achieved over the last ten years.

**CL&P PILOTS HOME ENERGY REPORTING PROGRAM.** In early February, **Connecticut Light & Power (CL&P)** launched a new home energy reporting pilot program sponsored by the **Connecticut Energy Efficiency Fund** to help customers understand and reduce their energy usage. CL&P sent 24,000 randomly selected customers detailed information about their home's energy usage and tips to increase their energy efficiency. This is the first time a program such as this has been offered in Connecticut. According to OPOWER, the report developer, the program has consistently delivered 1.5- 3.5% in average energy savings to utility customers.



## Environment

**EPA REPORTS CT FACILITIES RELEASED FEWER TOXIC CHEMICALS IN 2009.** The US EPA reported that the 313 Connecticut facilities reporting to it cut their releases of toxic chemicals in 2009 by one-sixth, a decrease from 4.0 million tons in 2008 to 3.3 in 2009. The Connecticut decrease of 18% exceeded the 10% decrease in New England. In Connecticut, the top releases include nitrate compounds, ammonia, zinc compounds,

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sulfuric acid, copper compounds and hydrochloric acid. Facilities with the largest toxic chemical releases in 2009 were: **Dow NA Allyn's Point Plant** (Gales Ferry); **AES Thames LLC** (Uncasville); **Cytec Industries Inc.** (Wallingford); **U.S. Surgical** (North Haven); **GBC Metals LLC** (Somers); **Thin Strip** (Waterbury); **Lake Road Generating Co.** (Dayville); **Summit Corp. of America** (Thomaston); **Sartomer Co. Inc.** (Stratford); **Quality Rolling & Deburring Co. Inc.** (Thomaston); and **Latex International** (Shelton).

**CT BROWNFIELD CONVERSION HONORED, GREEN CIRCLE AWARDS ANNOUNCED.** The **Connecticut Brownfields Redevelopment Authority** received the Project of the Year Award from the Northeastern Economic Developers Association for its efforts in turning a former East Hartford tank farm into the 109,000 sq. ft. riverfront campus of **Goodwin College**, used by more than 2,500 students. In other news, 28 Connecticut civic organizations, individuals and businesses were honored for their environmental efforts with the state's annual GreenCircle Awards from the state **Department of Environmental Protection (DEP)**. Since the programs's inception in 1998, more than 750 awards have been granted to businesses, institutions, individuals and civic organizations for their involvement in over 1,100 projects. For a complete list recipients, see <http://www.ct.gov/dep/cwp/view.asp?A=2708&Q=323940>.

**DEP RECEIVES UNDERWATER RESEARCH CAMERA.** The state **Department of Environmental Protection's Office of Long Island Sound Programs** received a state-of-the-art underwater research camera on behalf of the **New England Regional Ocean Council** from Coastal America's Corporate Wetlands Restoration Partnership (CWRP). Coastal America is a partnership between federal, state and local governments and private organizations. The camera will be used by the DEP to study coastal and marine habitats and for public education efforts.

**BIOLOGICAL CONTROL OF TICKS.** As a result of research conducted at **The Connecticut Agricultural Experiment Station**, an insect-eating fungus called *Metarhizium anisopliae* F52 has been registered for the control of the deer (or blacklegged) tick, which transmits the pathogens of Lyme disease, babesiosis and human granulocytic anaplasmosis. Novozymes Biologicals, Inc. of Salem, VA, registered the fungus as Tick-Ex with the US Environmental Protection Agency (EPA) and the **Connecticut Department of Environmental Protection**. Experiment Station scientists **Kirby Stafford** and **Anuja Bharadwaj** found a spray of the fungus on grass could control 53-74% of nymphal ticks for 5 weeks during the summer. More than one application may be necessary for the entire tick season. Although the supply of the product will probably be limited in 2011, it should be widely available in 2012, providing another tool for the integrated management of ticks and prevention of illnesses that they transmit.



### Food & Agriculture

**REVICZKY NAMED AG COMMISSIONER.** Gov. Dannel Malloy selected Coventry farmer **Steven K. Reviczky** as the state's commissioner of agriculture. Most recently Reviczky was executive director of the **Connecticut Farm Bureau**. Prior to that, he was a property agent with the **Connecticut Department of Agriculture's Farmland Preservation Program**. Reviczky also served as the agency representative to the **State of Connecticut Council on Soil and Water Conservation**, the **Quinebaug-Shetucket Heritage Corridor Natural Resources/Agriculture Committee**, and the **Farm Transfer & Farm Succession Working Group**. Reviczky is a former First

Selectman in **Ashford** and a public policy & government graduate of **Eastern Connecticut State University**.

**'CT GROWN' EXPANDED TO FORESTRY PRODUCTS.** The **Department of Environmental Protection (DEP)** announced the expansion of the Connecticut Grown program to include the state's forestry products like lumber, firewood and Connecticut-made wood products. **Christopher Martin**, director of the division of forestry at DEP, says the hope is that CT Grown will do for forestry products what it has done since 1968 for locally produced food and agricultural products. Connecticut is 60% forested, says Martin, and a federal inventory shows that state's forests are declining. Wood products with the CT Grown label must be sustainably harvested in compliance with local and state regulations and vendors in the program agree to be audited randomly. DEP is currently developing criteria for different product types.

**WATCHING FOR INVASION BY AN ASIATIC PEST.** This spring, the state **Department of Environmental Protection**, in collaboration with the federal Animal Plant Health Inspection Service (APHIS), **The Connecticut Agricultural Experiment Station**, and the **University of Connecticut Cooperative Extension System**, and with assistance from the **Connecticut Department of Transportation**, will set up monitoring traps for the emerald ash borer. The state regulatory authority for plant pests lies with the Experiment Station, which surveys for insects and plant pathogens that threaten trees or agricultural crops. The emerald ash borer has been found nearby in neighboring states but not yet in Connecticut.

**GRANTS FOR SPECIALTY CROPS.** The Connecticut Department of Agriculture issued a request for grant applications for projects that solely enhance the competitiveness of specialty crops. Specialty crops are defined by the USDA as fruits and vegetables, dried fruit, tree nuts, maple syrup, honey, horticulture, and nursery crops (including floriculture). Projects can last up to three years and must benefit the specialty crop industry as a whole. Applications are due via email to the Connecticut Department of Agriculture by May, 17, 2011. For more go to [www.ct.gov/doag](http://www.ct.gov/doag) and search for "specialty crop."



### Health

**DANBURY HOSPITAL TO EXPAND.** **Danbury Hospital** is planning a \$150 million construction project to add nearly 300,000 square feet to its campus. Hospital officials say the addition is needed due to lack of space in the hospital's current emergency room. The current emergency room is equipped for 40,000 patient visits annually but actually sees nearly 70,000 patients. The project will include a new emergency room capable of 88,000 visits per year, a new patient tower with more private rooms and a welcoming center.

**HARTFORD HEALTHCARE COMPLETES EYE SURGERY CENTER DEAL.** **Hartford Healthcare** completed its \$28 million acquisition of Newington-based **Constitution Eye Surgery Center**. The deal makes Hartford Healthcare a major player in Greater Hartford's outpatient ambulatory eye surgery industry. Hartford Hospital officials said the acquisition is part of a strategic plan to create a regional center for excellence in eye-related care.

**AETNA EARLY DELIVERY PREVENTION INITIATIVE.** Hartford health insurer **Aetna** announced a number of infant safety programs that encourage women, doctors and hospitals to limit



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electively scheduled deliveries until after a minimum 39 weeks of pregnancy. The initiative, which is being launched in collaboration with the March of Dimes, The Leapfrog Group and others, aims to prevent early deliveries when they are not medically necessary. **Marjorie Schulman**, an Aetna senior medical director with 25 years of experience as a neonatal intensive care (NICU) doctor, says that every week prior to 39 weeks that a baby is delivered, the chance of health and development problems requiring NICU care nearly doubles.

**PREVENTING FALLS AMONG OLDER ADULTS.** New guidelines recommend exercise, including slow, controlled movements like tai chi, as a way to prevent falls among older adults. **Yale School of Medicine Professor Mary Tinetti**, a CASE member, co-chaired a panel of experts who developed the guidelines for the American and the British Geriatrics Society (*Journal of the American Geriatrics Society*, January). Falls are not only associated with significant injury and death in the older population, but are also linked to reduced independence and early admission to long-term care facilities.

**INFANTS WHO RECEIVE ANTIBIOTICS AT RISK FOR ASTHMA, ALLERGIES.** Children who receive antibiotics within the first six months of life are at a significantly increased risk of developing asthma and allergies by six years of age, even without a genetic predisposition, new research by the **Yale School of Public Health** suggests (*American Journal of Epidemiology* online.) The research shows that infants exposed to antibiotics during their first six months of life were up to 52% more likely to develop childhood asthma and allergies than their peers who did not receive antibiotics. While previous studies have also suggested this, those studies may have been biased because antibiotics are used to treat respiratory tract infections that could themselves be early symptoms of asthma. The Yale study sought to eliminate this bias and concluded that antibiotic use increased risk of childhood asthma even in children who have not experienced respiratory tract infections and in children whose asthma is first diagnosed after three years of age.



### High Technology

**YALE SCIENTISTS UNVEIL WORLD'S FIRST ANTI-LASER.** Scientists at **Yale University**, led by physicist and CASE member **A. Douglas Stone**, have built the world's first anti-laser, in which incoming beams of light interfere with one another in such a way as to cancel each other out (*Science*, Feb. 18). Stone and his team published a study last summer explaining the theory behind an anti-laser, demonstrating that such a device could be built using silicon. After working with Yale physicist **Hui Cao**'s experimental group, the team actually built a functioning anti-laser, which they call a coherent perfect absorber (CPA). The team focused two laser beams with a specific frequency into a cavity containing a silicon wafer. The wafer aligned the light waves in such a way that they became perfectly trapped, bouncing back and forth indefinitely until they were eventually absorbed and transformed into heat. Stone believes that CPAs could one day be used as optical switches, detectors and other components in the next generation of computers, as well as in radiology, either for therapeutic or imaging purposes.

**RED DWARF STARS FAR MORE PREVALENT THAN PREVIOUSLY THOUGHT.** Using powerful instruments on the Keck Observatory in Hawaii, astronomers discovered that small, dim stars known as red dwarfs may be three times more prevalent than previously

thought (*Nature*, Dec. 1 online). Until now, astronomers hadn't been able to detect red dwarfs in galaxies other than our own and its nearest neighbors. Through this research, **Yale University** astronomer **Pieter von Dokkum** and his team detected the faint signature of red dwarfs in eight massive, relatively nearby galaxies, located between 50 and 300 million light years away. They discovered that the red dwarfs—only 10 to 20% as massive as our sun—were much more bountiful than expected.

**CI ANNOUNCES FIRST PRE-SEED FUNDS.** In February, **Connecticut Innovations Inc. (CI)** announced \$1 million in funding for seven technology startups in the first awards from the quasi-public technology investment arm's pre-seed fund. The firms are:

- **AlloStem Therapeutics LLC** (Farmington)
- **Alphachromics Inc.** (Farmington)
- **CMDBioscience LLC** (Orange)
- **eGen LLC** (Groton)
- **Floop Inc.** (New Haven)
- **HDB Newco Inc.** (New Haven)
- **Shizzlr Inc.** (New Haven)

The firms had to find matching funds from private investors to collect their pre-seed stakes from CI. CI's pre-seed fund totals \$4 million and provides loans up to \$150,000 for startup and early-stage technology companies. The fund was first launched five months ago.



### Transportation

**METRO TAXI EXPANDING DISABILITY SERVICES.** New Haven-based **Metro Taxi** is partnering with Hartford's **Yellow Cab Company** to increase its wheelchair-accessible cab fleet from one to 140 natural gas-fueled cars. The enhanced taxis will cost no more than Metro Taxi's existing 161 vehicles. Metro Taxi CEO and President **Bill Scalzi** said that one wheelchair taxi serving 30 towns is not enough. While the purchase of the natural-gas vehicles was approved by the US Department of Energy, hearings for approval from the **Connecticut Department of Transportation** were ongoing through March. "We think a fleet of vehicles is required in order to make a program available for all those with mobility disabilities truly viable," Scalzi said.

**GREEN DRIVING.** The **Connecticut Department of Motor Vehicles (DMV)** is promoting environmentally friendly driving. New Canaan teenager **Katherine Schultz**, who championed the cause along with her father **Bob Schultz**, worked with the DMV to create videos demonstrating environmentally friendly driving. The videos and information are available on the DMV website ([www.ct.gov/dmv](http://www.ct.gov/dmv)) and will be distributed in the state driver's manual.

**EIGHT M8S START SERVICE.** The first eight of **Metro-North's** new Kawasaki M8 rail cars went into service on March 2, indicating that the cars passed 4,000 miles of problem-free testing. The next cars to go in service will need to pass only 1,000 miles of testing. The state has committed to buy 380 of the M8s.

— *Compiled and edited by Ann G. Bertini, Assistant Director for Programs, Connecticut Academy of Science and Engineering*

## Bridgeport's Discovery Museum Seeks to "Engage, Excite, Educate"



*A summer program participant checks out the museum's resident research submarine.*

*[Photo: Discovery Museum]*

The Discovery Museum opened in Bridgeport in 1961 as the multi-faceted Museum of Art, Science and Industry. Today, the museum has refined its mission and evolved into a vital regional science center whose mission is to "engage, excite and educate" visitors in the exploration of science, technology and ideas. Specialties include physical science, ocean and environmental science, space science and astronomy, with an emphasis on hands-on learning for students in Grades 3–8.

The Discovery Museum's 20,000 square foot facility includes both permanent and traveling interactive exhibit galleries, a 124-seat planetarium, a Challenger Learning Center, an 80-seat auditorium, as well as five multi-purpose classrooms where more than 70 hands-on science programs are offered for schools and groups on both an in-house and outreach basis. Programs support the CT Science Education Framework. Nearly 40,000 children participate in the museum's science programs, outreach activities and summer programs each year. According to Director of Education Alan Winick, "We specialize in making science accessible to everyone, mining the natural curiosity of our young visitors, and rekindling that natural curiosity in our adult visitors."

Recently, the museum worked with the Bridgeport Public Schools, the City of Bridgeport, and Sacred Heart University to establish the Discovery Interdistrict Magnet School, a public science magnet school built on Discovery Museum grounds. This state-of-the-art science school, which opened its doors in January 2011, will serve approximately 500 students in Grades Pre-K through 8 from both Bridgeport and surrounding suburban communities. Truly a landmark effort, Discovery Magnet represents a unique partnership among a public school, a university and an informal science education institution.

### From the National Academies *(from page 1)*

bles, and whole grains, and lower the amount of saturated fat, trans fat, and sodium in meals provided to more than 32 million schoolchildren who participate in these meal programs. The changes largely mirror recommendations made by the Institute of Medicine in a 2009 report, *School Meals: Building Blocks for Healthy Children*. The USDA will accept public comments on the proposed changes through April 13. Secretary of Agriculture Tom Vilsack says he hopes schools will begin to initiate these changes in the fall of 2011.

<http://national-academies.org/headlines/20110118.html>

#### ◆ Lower Fluoride Levels in Drinking Water Proposed

The US Department of Health and Human Services (HHS) announced a federal proposal to reduce the recommended level of fluoride in drinking water to prevent a discoloration and pitting of the teeth known as dental fluorosis. HHS is proposing that the recommended level of fluoride in drinking water can be set at the lowest end of the current optimal range to prevent tooth decay, and the federal Environmental Protection Agency (EPA) is initiating review of the maximum amount of fluoride allowed in drinking water.

The proposal is based in part on EPA assessments that were prompted by a 2006 National Research Council report, which recommended that EPA reconsider its fluoride standards to take into account health effects such as dental fluorosis and consider all sources, including toothpaste and mouthwash, of fluoride exposure. These actions will maximize the health benefits of water fluoridation, an important tool in the prevention of tooth decay while reducing the possibility of children receiving too much fluoride.

<http://www.hhs.gov/news/press/2011pres/01/20110107a.html>

#### ◆ Computer Games and Simulations Offer New Potential for Science Education

At a time when scientific and technological competence is vital to the nation's future, the weak performance of US students in science reflects the uneven quality of current science education. Many experts have called for a new approach to science education, based on recent and ongoing research on teaching and learning. In this approach, simulations and games could play a significant role

by addressing many goals and mechanisms for learning science: the motivation to learn science, conceptual understanding, science process skills, understanding of the nature of science, scientific discourse and argumentation, and identification with science and science learning.

To explore this potential, a new book from the National Academies Press, entitled *Learning Science: Computer Games, Simulations, and Education*, reviews the available research on learning science through interaction with digital simulations and games. It considers the potential of digital games and simulations to contribute to learning science in schools, in informal out-of-school settings, and everyday life. The book also identifies the areas in which more research and research-based development is needed to fully capitalize on this potential. *Learning Science* will guide academic researchers; developers, publishers, and entrepreneurs from the digital simulation and gaming community; and education practitioners and policy makers toward the formation of research and development partnerships that will facilitate rich intellectual collaboration.

[http://www.nap.edu/catalog.php?record\\_id=13078](http://www.nap.edu/catalog.php?record_id=13078)

#### ◆ Shorter US Lifespans Tied to Past Smoking, Obesity

The nation's history of heavy smoking is a major reason why lifespans in the United States fall short of those in many other high-income nations, and evidence suggests that current obesity levels also play a substantial part, says a new report from the National Research Council.

Over the last 25 years, life expectancy at age 50 in the United States has risen, but at a slower pace than in many other high-income countries, a difference particularly notable given that the United States spends more on health care than any other nation. Because of a lag of two to three decades between smoking and its peak effects on mortality, one can predict how smoking will affect life expectancy over the next 20 to 30 years. On this basis, life expectancy for US men is likely to improve relatively rapidly in coming decades because of reductions in smoking in the last 20 years, the report says. For US women, whose smoking behavior peaked later than men's, declines in mortality are apt to remain slow for the next decade.

[http://www.nap.edu/catalog.php?record\\_id=13089](http://www.nap.edu/catalog.php?record_id=13089)

Visit our web site at [www.ctcase.org](http://www.ctcase.org)

## Nuclear Power *(from page 2)*

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Located on a hill above the plant site is the Independent Spent Fuel Storage Installation (ISFSI), which is roughly the size of a football field. It consists of 43 dry storage casks mounted on a 100 x 200 foot, 3-foot thick concrete pad, surrounded by a high fence with a buffer zone of 300 meters outside of the fence, making for about a 100-125 acre land area. (See <http://www.connyankee.com> for details.) Forty of the casks contain almost all of the fuel assemblies used over the entire 28-year life of the plant. Three of the 43 casks contain reactor vessel parts.

Each cask is a vertical concrete cylinder (with a reinforced 21-inch wall), about 12-13 feet in diameter and about 20 feet high. Each contains a cylindrical steel canister with 3.5-inch thick walls, loaded with used fuel assemblies. The steel canister exterior is ringed with circumferential fins which dissipate, by natural convection, heat generated by the spent fuel. Air flows into the concrete casks at bottom openings and exits at screened openings at the top. Each cask weighs 126 tons and costs about \$1M. They are licensed for a 20-year storage time, but could go up to 40-60 years (or longer). One possible future scenario would be that the appropriate federal agency might take possession of the ISFSI – and just leave the casks in place, considering the cost of moving them to a “permanent” storage site if one is ever chosen. The cost of maintaining the CY ISFSI is about \$3M/year.

Dominion, the Virginia-based energy company that owns Millstone, hosted a visit of the committee to this 2,024 MWe nuclear plant last November. With Units 2 and 3 in operation, the plant that supplies about half of the state’s electricity has 1,100 full-time employees (plus a security force) in Waterford.

In the future, if another 1,000 MWe unit were added to Units 2 and 3, based on current prices, it might cost \$5-6B. Under Connecticut’s

**“Connecticut is one of only six states where nuclear power is the primary means of electrical generation.”**

old, regulated electric utility system, it might have been possible to finance such a huge investment, the way Units 2 and 3 were financed. With our currently deregulated system, it can be difficult for a private power provider to get such major funding (if indeed their long-term business plan supports such a commitment).

This question of financing affordability for a large nuclear power plant is one factor that has led to the recent study and development of small modular reactors (SMRs) by such companies as Westinghouse and Babcock & Wilcox. These will be smaller, standardized modular nuclear power plants in the 100-300 MWe range. The advantages offered by the SMR concept include lowered unit costs in the \$0.5-1B range, a standardized design, and the ability to more easily add future modules at the same site.

The CASE Nuclear Power Study Committee is investigating the pros and cons of SMRs to see if they make sense for Connecticut. At the federal level, the Nuclear Regulatory Commission is studying the licensing framework for SMRs. In addition, US Secretary of Energy Steven Chu established the Blue Ribbon Commission on America’s Nuclear Future in January 2010, at the direction of President Obama. The Commission is reviewing policies for managing the nuclear fuel cycle and is expected to issue recommendations within 24 months. — **Lee Langston is Professor Emeritus of Mechanical Engineering at the University of Connecticut and Chair of the CASE Nuclear Power Study Committee.**

**NUCLEAR ENERGY ADVISORY COUNCIL**  
**7:00 PM**  
**August 24, 2011**  
**BOARD OF EDUCATION CONFERENCE ROOM**  
**WATERFORD TOWN HALL**  
**15 ROPE FERRY ROAD**  
**WATERFORD, CT**  
**SPECIAL MEETING**  
**MINUTES**

**Members Present**

Mr. Bill Sheehan, Chair  
Ms. Pearl Rathbun, Vice Chair  
Mr. Robert Klancko  
Mr. John Markowicz  
Dr. Gregg Dixon  
Ms. Marjorie DeBold  
Representative Kevin Ryan  
Mr. James Sherrard  
Absent:  
Mr. Denny Hicks  
Mr. Tom Nebel  
Dr. Edward Wilds Representing Commissioner Esty

**1. Call to Order of Meeting**

NEAC Chair Sheehan called the meeting to order at 7:03PM at Waterford Board of Education Conference Room in Waterford, Connecticut.

**2. Approval of Minutes of May 25, 2011 Meeting**

Motion by Mr. Markowicz/Dr. Dixon to Approve minutes. Minutes approved with Rep Ryan and MR. Klancko abstaining.

**3. Presentation on the Blue Ribbon Committee Nuclear Waste Disposal Report by Cort Richardson, Director, NE High Level Radioactive Waste Transportation Project**

See attached power point presentation. Mr. Richardson also asked for NEAC representation at the October 12, 2011 hearing in Boston on the Blue Ribbon Commission Report.

**4. Public Comment**

No public comment

**5. NRC Correspondence Received since last meeting**

There were no questions from members regarding the correspondence received since the last meeting.

**6. Next Meeting Date and Time**

After a brief discussion it was decided to meet on September 22, 2011 for a presentation by representatives of Millstone Power Station. If possible, the Chairman was also to arrange for a tour of the MPS1 Spent Fuel Pool.

**7. Adjournment**

Motion was made and seconded to adjourn; no objections; unanimous vote in favor; meeting adjourned at 9:35 PM.



THE COUNCIL OF STATE GOVERNMENTS  
EASTERN REGIONAL CONFERENCE

# Northeast High-Level Radioactive Waste Transportation Project

## Blue Ribbon Commission on America's Nuclear Future – Draft Report

Nuclear Energy Advisory Council - August 24, 2011  
Town Hall - Waterford, CT  
Cort Richardson, Director



# THE COUNCIL OF STATE GOVERNMENTS

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### **Northeast High-Level Radioactive Waste Transportation Project**

- Office: 3 Shipman Place; Montpelier, VT 05602
- Sponsored by The Council of State Governments (CSG), a nonpartisan, nonprofit organization that seeks to foster excellence in state government & develop policy options for states
- CSG is headquartered in KY w/4 regional offices
- Project funded by Department of Energy (DOE) cooperative agreement grants



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### **Project Activities**

- Facilitate communication between DOE & states to plan SNF/HLRW/TRU transport
- Monitor DOE high-level, transuranic and high profile shipments through the NE
- Coordinate with other state regional groups
- Promote ER training for state/locals
  - Transportation Emergency Preparedness Program: MERRTT, T-MERRTT, RSP
  - TRANSCOM: shipment tracking system





# THE COUNCIL OF STATE GOVERNMENTS

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### **NE High-Level Radioactive Waste Task Force**

- Members and alternates from ten northeast states (New England plus NY, PA, NJ, and DE)
- Governor-appointed representatives from executive branch agencies including emergency management, environmental protection, radiation health, utility regulation, public safety and transportation departments
- May add legislative liaisons in future
- Meets 1-2x/yr w/Project staff, federal agencies and other stakeholders



# THE COUNCIL OF STATE GOVERNMENTS

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### **Past Meeting Reports**

#### **History of HLW/SNF Disposal Policy**

- \* NWPA 82+87/02, NWF, 98, YMP, \$ cuts, progress**

#### **Redirection of Rad Waste Policy**

- \* Obama/Reid, YMP work/\$ ended, LA withdrawn**

#### **Yucca MT Closing Aftermath**

- \* 3 states sue, ASLB rejects DOE on LA, NRC discord, Congress split, N industry pushes options**

#### **Blue Ribbon Commission est. 2/2010**

- \* membership, purposes, schedule, subcommittees**



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### Blue Ribbon Commission Basics

- Purposes:
  - 1) Conduct comprehensive review of policies for managing the back end of the nuclear fuel cycle;
  - 2) Recommend storage, processing, and disposal options for civilian/defense SNF & HLW; and
  - 3) Report findings to President & Congress within 2 years
- Subcommittees:
  - Disposal
  - Fuel Cycle
  - Transportation and Storage



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### **Blue Ribbon Commission Endgame**

- 3 Subcommittee reports released – June 20, 2011
- Draft full Commission report issued – July 29, 2011
- BRC announces public meeting schedule – August 11, 2011
  - WGA: Denver, CO – September 13, 2011
  - CSG-ERC & NE Task Force: Boston, MA – October 12, 2011
  - SSEB: Atlanta, GA – October 18, 2011
  - BRC: Washington, DC – October 20, 2011 October 28, 2011
  - CSG-MW: Minneapolis, MN – October 28, 2011
- Public comments due – October 31, 2011
- Final report due to President & Congress – January 29, 2011



# THE COUNCIL OF STATE GOVERNMENTS EASTERN REGIONAL CONFERENCE

## **Key Areas Covered in Draft Report**

- Program Governance and Execution
- Nuclear Waste Fee and Fund
- Approach to Siting
- Reactor & Fuel Cycle Technologies
- Transport of SNF and HLW
- Storage of SNF and HLW
- Disposal System for SNF and HLW



# THE COUNCIL OF STATE GOVERNMENTS

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### **Draft Report – General Conclusions**

- **Continuing same approach seems destined to bring further controversy, litigation, and protracted delay**
- **Failed policy damages nation's energy supply, state–federal relations, public confidence in federal gov't, America's standing in the world as a leader on global issues of nuclear safety, non-proliferation and security**
- **Also costly to:**
  - **Utility ratepayers supporting ongoing on-site storage and security**
  - **Federal taxpayers facing \$billions in utility law suit awards**
  - **Local communities, unwilling hosts to nuclear waste storage facilities**
- **Fukushima Daichii nuclear accident lends new urgency**
- **New strategy needed to avoid burdening future generations w/hazardous wastes they didn't create or benefit from**



# THE COUNCIL OF STATE GOVERNMENTS EASTERN REGIONAL CONFERENCE

## **What the Draft Report did not do**

- **Make specific recommendations about the future role of domestic nuclear power**
- **Take a position on the future of the Yucca Mountain Repository Project**
- **Evaluate the suitability of other possible locations for siting national HLW repositories**



# THE COUNCIL OF STATE GOVERNMENTS

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### **Recommended strategy... 7 key elements:**

- 1. New, consent-based approach to siting future nuclear waste management facilities.**
- 2. New organization dedicated solely to implementing the waste management program, empowered authority to succeed.**
- 3. Access to the funds nuclear utility ratepayers are providing for the purpose of nuclear waste management.**
- 4. Prompt efforts to develop one or more geologic disposal sites**
- 5. Prompt efforts to develop interim storage facilities.**
- 6. Support for continued U.S. innovation in nuclear energy technology and for workforce development.**
- 7. U.S. leadership in international efforts to address safety, waste management, nonproliferation and security concerns.**





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### **Legislation Needed to Make Changes...**

- **NWPA only provides for one repository site at Yucca Mt**
- **Authorize a new consent-based process used for selecting & evaluating sites and licensing consolidated storage and disposal facilities**
- **Authorize consolidated interim storage facilities independent of schedule for opening a repository and with adequate capacity to be sited, licensed, and constructed when needed.**
- **Establish a new waste management organization responsible for implementing nation's nuclear waste management program currently assigned to U.S. DOE**



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- **Responsibility should be moved to a new, independent, government-chartered corporation solely focused on managing SNF and HLW radioactive wastes o**
- **Appropriate oversight needs to be established**
- **Access to dedicated funding assured; current federal budget rules and laws deny the nuclear waste program access to NWF fees**
- **Ratepayers to finance the commercial share of the waste program's expenses**
- **Access to NWF and future fees independent of annual Congressional appropriations process**
- **Promote international engagement to support safe and secure waste management to help other countries manage rad wastes in safe, secure manner**



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### **Nuclear Waste Fund Status**

- Established by NWPA-'82'; pays for IOU SNF disposal
- \$750 million/yr. collected from utility ratepayers
- \$14 billion spent on Yucca Mt Project to date
- \$25 billion balance in fund
- \$92 billion: total needed to complete YM repository
- DOE reported NWF sufficient at current growth rate
- Utility law suits have cost federal taxpayers \$billions
- Federal liability expected to grow at \$500 million/yr.



# THE COUNCIL OF STATE GOVERNMENTS

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### **BRC Recommendations for NWF**

- Amend NWPA to adjust DOE/utility standard contracts to remit collections only for actual SNF storage costs; place remainder in a trust account
- Congressional budget committees and OMB to work on changing budgetary rules so the NWF receipts directly offset waste program spending
- NWF no longer counted against budget deficit
- Eventually establish permanent fund arrangement



# THE COUNCIL OF STATE GOVERNMENTS

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### **What you can do...**

- **Review the draft BRC report ([www.brc.gov](http://www.brc.gov))**
- **Contact your state NE Task Force members to convey comments**
- **Attend the October 12, 2011 Boston public meeting**
- **Encourage your agency or group to comment directly to BRC website or mail to:**

**Mr. Timothy A. Frazier, Designated Federal Officer  
Blue Ribbon Commission on America's Nuclear Future  
U.S. Department of Energy  
1000 Independence Ave., SW  
Washington, DC 20585**



**THE COUNCIL OF STATE GOVERNMENTS**  
**EASTERN REGIONAL CONFERENCE**

**Joint Meeting of**  
**Blue Ribbon Commission on America's Nuclear Future**  
**And**  
**The Council of State Governments—Eastern Regional Conference**  
**Northeast High-Level Radioactive Waste Transportation Task Force**  
**October--12, 2011**

**Joseph B. Martin Conference Center**  
**Harvard Medical School**  
**77 Avenue Louis Pasteur; Boston MA**



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### **Northeast University/Research Reactors**

- **Cornell - Closed**
- **MIT – Active**
- **NIST (MD) - Active**
- **Penn State - Active**
- **RPI- Active**
- **RI Nuclear Science Center (RIAEC/URI) – Active**
- **U-Mass Lowell – Active, WPI SNF storage**
- **U-Buffalo - Closed**
- **Worcester Polytechnic Institute - Closed**



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*QUESTIONS?*





UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PA 19406-1415

May 27, 2011

EA-11-047

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

SUBJECT: MILLSTONE POWER STATION UNIT 2 - NRC SPECIAL INSPECTION  
REPORT 05000336/2011008; PRELIMINARY WHITE FINDING

Dear Mr. Heacock:

On April 14, 2011, the U. S. Nuclear Regulatory Commission (NRC) completed a Special Inspection at your Millstone Power Station (Millstone) Unit 2. The inspection was conducted in response to an unanticipated reactor power transient event that occurred on February 12, 2011. The NRC's initial evaluation of this event satisfied the criteria in NRC Inspection Manual Chapter 0309, "Reactive Inspection Decision Basis for Reactors," for conducting a special inspection. The Special Inspection Team (SIT) Charter (Attachment 2 of the enclosed report) provides the basis and additional details concerning the scope of the inspection. The enclosed inspection report documents the inspection results, which were discussed at the exit meeting on April 14, 2011, with Mr. A. J. Jordan, Millstone Site Vice President, and other members of your staff.

The Special Inspection Team (the team) examined activities conducted under your license as they relate to safety and compliance with Commission rules and regulations and with the conditions of your license. The team reviewed selected procedures and records, observed activities, and interviewed personnel. In particular, the team reviewed event evaluations, causal investigations, relevant performance history, and extent-of-condition to assess the significance and potential consequences of issues related to the February 12 event.

The team concluded that the plant operated within acceptable power limits and no equipment malfunctioned during the power transient. Nonetheless, the team identified several issues related to procedure discrepancies and human performance that complicated the event. Additionally, the team noted that Dominion's initial response to the event was not appropriately thorough and timely, did not highlight the significance of the unplanned power increase and reactivity control issues, and was narrowly focused. The enclosed chronology (Attachment 3 of the enclosed report) provides additional details regarding the sequence of events and event complications.

This report documents one finding that, using the reactor safety Significance Determination Process (SDP), has preliminarily been determined to be White, or of low to moderate safety significance. The finding is associated with a performance deficiency involving the failure of Millstone personnel to carry out their assigned roles and responsibilities and inadequate

reactivity management during main turbine control valve testing, which contributed to the unanticipated reactor power increase. Specifically, the Millstone Unit 2 operations crew failed to implement written procedures that delineated appropriate authorities and responsibilities for safe operation and shutdown, and a procedure for controlling reactor reactivity. In addition, the licensee failed to establish written procedures for Reactor Protection System (RPS) Variable High-Power Trip (VHT) setpoint reset and for power operation and transients involving multiple reactivity additions.

This finding was assessed using NRC Inspection Manual Chapter (IMC) 0609, Appendix M, "SDP Using Qualitative Criteria," because it involved human performance errors. Preliminarily, the NRC has determined this finding to be of low to moderate safety significance based on a qualitative assessment. There were no immediate safety concerns following the transient because the event itself did not result in power exceeding license limits or fuel damage. Additionally, interim corrective actions were taken, which included removing the Millstone Unit 2 control room crew involved in the transient from operational duties pending remediation, and establishment of continuous management presence in the Millstone Unit 2 control room while long term corrective actions were developed.

The finding involved two apparent violations (AVs) of NRC requirements involving Technical Specification 6.8, "Procedures," that are being considered for escalated enforcement action in accordance with the Enforcement Policy, which can be found on NRC's Web site at <http://www.nrc.gov/reading-rom/doc-collections/enforcement/>.

In accordance with NRC Inspection Manual Chapter (IMC) 0609, we will complete our evaluation using the best available information and issue our final determination of safety significance within 90 days of the date of this letter. The significance determination process encourages an open dialogue between the NRC staff and the licensee; however, the dialogue should not impact the timeliness of the staff's final determination. Before we make a final decision on this matter, we are providing you with an opportunity to (1) attend a Regulatory Conference where you can present to the NRC your perspective on the facts and assumptions the NRC used to arrive at the finding and assess its significance, or (2) submit your position on the finding to the NRC in writing. If you request a Regulatory Conference, it should be held within 30 days of your response to this letter, and we encourage you to submit supporting documentation at least one week prior to the conference in an effort to make the conference more efficient and effective. If a Regulatory Conference is held, it will be open for public observation. If you decide to submit only a written response, such submittal should be sent to the NRC within 30 days of your receipt of this letter. If you decline to request a Regulatory Conference or submit a written response, you relinquish your right to appeal the final SDP determination, in that by not doing either, you fail to meet the appeal requirements stated in the Prerequisite and Limitation Sections of Attachment 2 of IMC 0609.

Please contact Sam Hansell by telephone at (610) 337-5046 and in writing within 10 days from the issue date of this letter to notify the NRC of your intentions. If we have not heard from you within 10 days, we will continue with our significance determination and enforcement decision. The final resolution of this matter will be conveyed in separate correspondence.

Because the NRC has not made a final determination in this matter, no Notice of Violation is being issued for this inspection finding at this time. Please be advised that the number and characterization of the apparent violations described in the enclosed inspection report may

D. Heacock

3

change as a result of further NRC review. In addition, the report documents one self-revealing finding, of very low safety significance (Green). This finding did not involve a violation of NRC requirements.

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 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,

Handwritten signature of Christopher G. Miller, consisting of stylized initials 'CGM' followed by the word 'for'.

Christopher G. Miller, Director  
Division of Reactor Safety

Docket No. 50-336  
License No. DPR-65

Enclosure: Inspection Report 05000336/2011008  
w/Attachments: Supplemental Information (Attachment 1)  
Special Inspection Team Charter (Attachment 2)  
Detailed Sequence of Events (Attachment 3)  
Appendix M Table 4.1 (Attachment 4)

cc w/encl: Distribution via ListServ

D. Heacock

3

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Sincerely,

*/RA/  
Peter R. Wilson for:*

Christopher G. Miller, Director  
Division of Reactor Safety

Docket No. 50-336  
License No. DPR-65

Enclosure: Inspection Report 05000336/2011008  
w/Attachments: Supplemental Information (Attachment 1)  
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Detailed Sequence of Events (Attachment 3)  
Appendix M Table 4.1 (Attachment 4)

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Distribution w/encl: See next page

SUNSI Review Complete:     PAP     (Reviewer's Initials)

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DATE	05/25/11	05/26/11	05/25/11	05/25/11	05/25/11
OFFICE	RI/DRS				
NAME	CMiller/prw for				
DATE	05/27/11				

\*See Previous Concurrence Page

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**U. S. NUCLEAR REGULATORY COMMISSION**

**REGION I**

Docket No.: 50-336

License No.: DPR-65

Report No.: 05000336/2011008

Licensee: Dominion Nuclear Connecticut, Inc

Facility: Millstone Power Station, Unit 2

Location: P.O. Box 128  
Waterford, CT 06385

Dates: February 22 through April 14, 2011

Team Leader: P. Presby, Senior Operations Engineer, Division of Reactor Safety

Team: B. Haagensen, Resident Inspector, Division of Reactor Projects  
B. Fuller, Operations Engineer, Division of Reactor Safety

Observers: D. Galloway, Program Supervisor, Connecticut Department of  
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## SUMMARY OF FINDINGS

IR 05000336/2011008; 02/22/2011 - 04/14/2011; Millstone Nuclear Power Station (Millstone) Unit 2; Special Inspection for the February 12, 2011, Unanticipated Reactor Power Transient Event; Inspection Procedure 93812, Special Inspection.

A three-person NRC team, comprised of two regional inspectors and one resident inspector, conducted this Special Inspection. One representative from the State of Connecticut, Department of Environmental Protection accompanied the team. One finding with potential for greater than Green safety significance and one Green finding were identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP); the crosscutting aspect was determined using IMC 0310, "Components Within the Cross Cutting Areas;" and 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.

### NRC Identified and Self Revealing Findings

#### Cornerstone: Initiating Events

- **Preliminary White:** A self-revealing finding was identified involving the failure of Millstone personnel to carry out their assigned roles and responsibilities and inadequate reactivity management during main turbine control valve testing on February 12, 2011, which contributed to the unanticipated reactor power increase. Specifically, the Millstone Unit 2 operations crew failed to implement written procedures that delineated appropriate authorities and responsibilities for safe operation and shutdown and a procedure for controlling reactor reactivity. In addition, the licensee failed to establish written procedures for the Reactor Protection System (RPS) Variable High-Power Trip (VHT), and for power operation and transients involving multiple reactivity additions.

The finding has preliminarily been determined to be White, or of low to moderate safety significance. The finding is also associated with two apparent violations of NRC requirements specified by Technical Specifications. There were no immediate safety concerns following the transient because the event itself did not result in power exceeding license limits or fuel damage. Additionally, interim corrective actions were taken, which included removing the Millstone Unit 2 control room crew involved in the transient from operational duties pending remediation, and establishment of continuous management presence in the Millstone Unit 2 control room while long term corrective actions were developed. Dominion entered this issue, including the evaluation of extent-of-condition, into the corrective action program (CR413602) and performed a root cause evaluation (RCE).

The finding is more than minor because the performance deficiency (PD) was associated with the human performance attribute of the Initiating Events cornerstone and affected the cornerstone objective of limiting the likelihood of those events that upset plant

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stability and challenge critical safety functions during power operations. Additionally, the PD could be viewed as a precursor to a significant event. Because the finding primarily involved human performance errors, probabilistic risk assessment tools were not well suited for evaluating its significance. The team determined that the criteria for using IMC 0609, Appendix M, "Significance Determination Process Using Qualitative Criteria," were met, and the finding was evaluated using this guidance, as described in Attachment 4 to this report. Based on the qualitative review of this finding, regional management concluded the finding was preliminary of low to moderate safety significance (preliminary White).

The team determined that the PD resulted from several causes; however, the team concluded that the primary cause was ineffective reinforcement of Dominion standards and expectations. The team also concluded that this finding had a cross-cutting aspect in the Human Performance area, Decision Making component, because Dominion licensed personnel did not make the appropriate safety-significant decisions, especially when faced with uncertain or unexpected plant conditions to ensure safety was maintained. This includes formally defining the authority and roles for decisions affecting nuclear safety, communicating these roles to applicable personnel, and implementing these roles and authorities as designed [H.1(a)]. (Section 2.1)

- **Green:** The team identified a self-revealing finding of very low safety significance (Green) for improper operation of the turbine controls during turbine control valve testing. Specifically, the inspectors identified that control room operators failed to correctly implement surveillance procedure SP-2651N, "Main Control Valve Testing." Incorrect operation of the turbine controls caused an unplanned power increase from 88 percent to 96 percent. Dominion entered this issue into the corrective action program (CR415094).

The team determined that this finding was more than minor because it was similar to NRC Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," Example 4b, in that the incorrect operation of the turbine load selector pushbutton caused a plant transient. The finding was associated with the human performance attribute of the Initiating Events cornerstone and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. The team concluded that the finding was of very low safety significance (Green) because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. Enforcement action does not apply because the performance deficiency did not involve a violation of a regulatory requirement. The team also determined that the finding had a cross-cutting aspect in the Human Performance area, Resources component, because Dominion did not provide adequate training of personnel and sufficient qualified personnel [H.2(b)]. (Section 2.2)



## REPORT DETAILS

### 1. Background and Description of Event

In accordance with the Special Inspection Team (SIT) Charter (Attachment 2), team members (the team) conducted a detailed review of the February 12, 2011, unanticipated reactor power transient event at Millstone Nuclear Power Station (Millstone) Unit 2, including a review of Millstone Unit 2 operators' response to the event. The team gathered information from the plant process computer (PPC) alarm printouts and parameter trends, interviewed station personnel, observed an event reconstruction on the simulator, observed on-going control room activities, and reviewed procedures, logs, and various technical documents to develop a detailed timeline of the event (Attachment 3).

On Saturday February 12, 2011, Millstone Unit 2 experienced an unintended 8 percent reactor power transient (88 percent to 96 percent) during the performance of quarterly main turbine control valve testing. As more fully described below, the transient was caused by multiple human performance errors committed independently by the operators involved with the testing, and was compounded by problems in communications and command and control.

Two days prior to the event, the control room operating crew that was involved with the event attended a four hour just-in-time simulator training session for the planned reactor power decrease to 88 percent and the Millstone Unit 2 main turbine control valve testing evolution. The crew also received a briefing on the planned evolution from Millstone Operations Department management on February 12, just prior to beginning the main turbine control valve test.

On the day of the Millstone Unit 2 main turbine control valve test, the Millstone Unit 2 control room was staffed with the following normal five-person crew complement:

- Shift Manager (SM);
- Unit Supervisor (US);
- Operator At The Controls Reactor Operator (OATC RO);
- Balance of Plant Reactor Operator (BOP RO); and
- Shift Technical Advisor (STA), a non-licensed position.

Additionally, 3 other individuals were in the control room specifically to support performance of the test:

- an SRO-licensed and SM-qualified individual to provide operations management oversight;
- an SRO-licensed individual designated as the "Reactivity SRO" to directly supervise all reactivity changes; and
- a Reactor Engineer to assist with development and implementation of the reactivity plan.

Initial conditions for the control valve testing were established as follows:

1. Unit 2 reactor power was reduced to 88 percent.
2. The main turbine valve control was transferred from Load Limit to Load Set, applying a control signal to position the turbine control valves to maintain the existing main generator load.
3. The crew adjusted turbine load and the turbine bypass valve controller automatic setpoint to open one of the turbine bypass valves approximately 10 percent. Turbine bypass flow is established by the test procedure to allow the turbine bypass controller to automatically compensate for any small steam flow perturbations, thereby maintaining constant reactor power during testing.

A 600 gallon reactor coolant system (RCS) dilution was initiated to compensate for the effects of core fission product poison (Xenon) concentration changes initiated by the reactor power reduction.

The test procedure provided direction to the operators to maintain constant turbine first stage pressure ( $\pm 10$  psig) using the Load Set INCREASE and DECREASE pushbuttons while slowly rotating the turbine first stage pressure feedback potentiometer from the OUT to the IN position over a one minute period. Insertion of first stage pressure feedback into the control loop ensures the control valves change position in response to changes in first stage pressure, which varies linearly with turbine load. When a control valve is stroked closed for testing, load set control with first stage pressure feedback attempts to automatically maintain turbine load constant by opening the other three control valves in response to decreasing first stage pressure.

At approximately 11:30 am, the BOP RO correctly began rotating the turbine first stage pressure potentiometer toward the IN position. However, in response to increasing turbine first stage pressure, the BOP RO incorrectly depressed the INCREASE load selector button (rather than the DECREASE load selector button), thereby increasing steam supplied to the turbine and further increasing first stage pressure. When the operator did not get the desired response (a reduction in first stage pressure), the BOP RO pressed the INCREASE pushbutton 3 more times, followed by two depressions of the DECREASE pushbutton. The increased steam demand by the turbine resulted in lower RCS cold leg temperature, the automatic closure of the one partially open turbine bypass valve, and a reactor power transient over a three minute period which peaked at 96 percent power.

Neither the STA (who was performing the peer-check) nor the US (who was observing the test) initially corrected the BOP RO, because both also incorrectly believed pressing the INCREASE button was the correct action. Additionally, none of these three individuals informed the rest of the crew that they had an unexpected response and that a transient was in progress.

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At the onset of the event, the RPS VHT setpoints were below 96 percent (Ch A at 95.7 percent, Ch B at 95.4 percent, Ch C at 94.9 percent, and Ch D at 94.4 percent). During the turbine transient, reactor power increased toward the VHT setpoints. The Reactivity SRO observed the illumination of the VHT setpoint reset permissive lights (one light per RPS channel), and incorrectly assumed they were illuminating due to minor power fluctuations associated with the fission product poison build-in and on-going RCS dilution. Consequently, he increased the margin to the trip setpoint by resetting the VHT setpoints upward four times during the power rise. If the SRO had not reset the VHT, the RPS would have automatically initiated a high power reactor trip due to the magnitude of the reactor power increase from 88 to 96 percent. In addition to preventing the automatic trip, the Reactivity SRO did not understand or question why reactor power was increasing, and did not inform anyone on the crew of his actions to reset the VHT setpoints.

The SM observed the closure of the partially open turbine bypass valve and directed the OATC RO to lower the turbine bypass valve controller setpoint to re-open the valve and directed the Reactivity SRO to withdraw one bank of control rods four steps to raise reactor temperature. Each of these actions added further positive reactivity and contributed to the reactor power increase. He also directed the US to return to a position of oversight and he directed the BOP RO to stop manipulating turbine controls.

After the plant stabilized, the SM incorrectly determined that the power transient had been limited to a maximum of four percent power, based on using the excore nuclear instruments instead of the more accurate Q-power indication, and decided to complete the turbine control valve testing before the end of the shift. Excore nuclear instruments did not accurately indicate the amount of the power increase due to normal instrument behavior in a significantly reduced primary coolant temperature environment. The full extent of the power transient was not identified until the next day when Millstone reactor engineers completed a formal assessment of the transient.

## 2. Human Performance

### 2.1 Overall Crew Performance

#### a. Inspection Scope

The team interviewed the Millstone Unit 2 control room personnel that responded to the February 12, 2011, event, including four SROs (SM, US, reactivity SRO, operations manager assigned to oversee evolution), two ROs (OATC RO, BOP RO), the STA and the Reactor Engineer to determine whether these personnel performed their duties in accordance with plant procedures and training. The team also reviewed narrative logs, sequence of events and alarm printouts, condition reports, PPC trend data, procedures implemented by the crew, and procedures regarding roles and responsibilities of operations personnel.

b. Findings/Observations

Multiple Examples of Procedural Violations and Inadequate Procedures Relating to Control Room Crew Performance During a Plant Transient

Introduction: A self-revealing finding was identified involving the failure of Millstone personnel to carry out their assigned roles and responsibilities and poor reactivity management during main turbine control valve testing on February 12, 2011, which contributed to the unanticipated reactor power increase. Specifically, the Millstone Unit 2 operations crew failed to implement written procedures that delineated appropriate authorities and responsibilities for safe operation and shutdown and a procedure for controlling reactor reactivity. In addition, the licensee failed to establish written procedures for the RPS VHT setpoint reset and for power operation and transients involving multiple reactivity additions.

The finding has preliminarily been determined to be White, or of low to moderate safety significance. The finding is also associated with two apparent violations of NRC requirements specified by Technical Specifications. There were no immediate safety concerns following the transient because the event itself did not result in power exceeding license limits or fuel damage. Additionally, interim corrective actions were taken, which included removing the Millstone Unit 2 control room crew involved in the transient from operational duties pending remediation, and establishment of continuous management presence in the Millstone Unit 2 control room while long term corrective actions were developed.

Description: On February 12, 2011, the Millstone Unit 2 control room crew was preparing to perform quarterly main turbine control valve testing. The unit was at 88 percent reactor power with one turbine bypass valve 10 percent open in automatic and the main turbine on Load Set control. Operators were in the process of placing turbine first stage pressure feedback in service.

During the conduct of the main turbine control valve testing, multiple operators failed to correctly implement written procedures as described below:

- a. Dominion Procedure OP-AP-300, "Reactivity Management," states the Reactor Operator will stop and question unexpected situations involving reactivity, criticality, power level, or core anomalies and will meet the anomalous indication with conservative action. Dominion Procedure OP-AA-106, "Infrequently Conducted or Complex Evolutions," establishes expectations for the need to stop the test or evolution when unexpected conditions arise or unexpected behavior is experienced. However, as the BOP RO placed turbine first stage pressure feedback in service, he noted an increase in first stage pressure and incorrectly pressed the turbine load set INCREASE pushbutton instead of the DECREASE pushbutton. When the BOP RO did not get the desired response, he depressed the INCREASE pushbutton three more times, followed by two depressions of the DECREASE pushbutton, rather than stopping in the face of uncertainty as expected. The actions by the BOP RO resulted in a rapid, unintended reactor power rise.

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- b. Dominion Procedure OP-AP-300, "Reactivity Management," states the Shift Technical Advisor will provide engineering expertise to shift operators, as required, during periods of significant reactivity changes. However, the STA was peer-checking the turbine manipulations and did not identify that the BOP RO actions were incorrect. Because the STA was dedicated to supporting the turbine evolution as the peer checker, he was unable to remain within his assigned role and did not provide his engineering expertise to the crew regarding the multiple inappropriate reactivity additions by other members of the crew.
- c. Dominion Procedure OP-AA-100, "Conduct of Operations," states the Unit Supervisor will provide oversight of plant operations and ensure the plant is operated safely in accordance with procedures. Dominion Procedure OP-AP-300, "Reactivity Management," states the Unit Supervisor will direct reactivity changes and ensure reactivity manipulations are made in a deliberate, carefully controlled manner. However, the US was focused on the turbine evolution during the event and did not provide effective oversight to the crew in responding to the power rise. The US also did not initially identify that the BOP RO should have been depressing the DECREASE rather than the INCREASE pushbutton. After the SM directed the US to resume his oversight role, the US did not clearly report to the rest of the crew that a power increase was in progress.
- d. Dominion Procedure OP-AA-100, "Conduct of Operations," states the Shift Manager will maintain a broad perspective of plant operations as the senior management representative on shift. However, the SM did not recognize that turbine operations were causing changes in plant parameters. He observed the closure of the partially open turbine bypass valve and, believing this to be the result of the effects of fission product poison build-in, directed the OATC RO to lower the turbine bypass valve controller setpoint to re-open the valve.
- e. Dominion Procedure OP-AP-300, "Reactivity Management," states the Reactor Operator will stop and question unexpected situations involving reactivity, criticality, power level, or core anomalies and will meet the anomalous indication with conservative action. However, the OATC RO, who was adding positive reactivity by diluting the RCS at the time, followed the SM's direction without question and adjusted the turbine bypass valve setpoint to reopen the valve, thereby adding additional positive reactivity to the core. The Millstone Unit 2 control room crew had practiced the control valve testing evolution on the simulator two days prior to the event with the OATC RO monitoring the turbine bypass valve position. This training apparently led the OATC RO to think his primary responsibility during the event was turbine bypass valve monitoring and control rather than his other reactivity control responsibilities as the Operator at the Controls.
- f. Dominion Procedure OP-AP-300, "Reactivity Management," states that adding positive reactivity is never an appropriate way to address unstable plant conditions, and also that it is non-conservative to withdraw control rods in an attempt to restore primary coolant temperature during a transient. However, after directing reopening of the turbine bypass valve, the SM directed the Reactivity SRO to withdraw one bank

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of control rods four steps to raise reactor temperature. This action added positive reactivity, thereby further exacerbating the power increase.

- g. Dominion Procedure OP-AP-300, "Reactivity Management," states the Reactivity SRO reports to the Unit Supervisor, has no concurrent duties, directly monitors the reactivity change, and will provide peer checks for the reactor operator for all reactivity manipulations. The Reactivity SRO had been monitoring the rod repositioning and RCS dilutions that were performed by the OATC RO as expected. When the OATC RO began monitoring turbine bypass valve position, the Reactivity SRO continued to monitor the ongoing RCS dilution. The Reactivity SRO believed that if he needed to personally manipulate any controls, he would no longer be acting as the Reactivity SRO. When the SM directed rod withdrawal, the Reactivity SRO glanced at a digital readout of RCS temperature, and, not noticing any change in the parameter, incorrectly concluded the plant was not in a transient and withdrew control rods.
- h. Dominion Procedure OP-AA-106, "Infrequently Conducted or Complex Evolutions," states the Senior Operations Manager assigned to oversight of the test will ensure tests are conducted in a manner that maximizes the margin of safety of the Unit. An SRO-licensed and SM-qualified individual was assigned to the control room to provide operations management oversight of the power reduction and testing for this infrequently performed evolution. His responsibilities included ensuring that the test was conducted in a manner that maximizes the margin of safety of the unit. However, this individual did not identify that the multiple reactivity additions, which were made during the transient, were inappropriate, either during or following the transient. He also did not identify that any members of the crew deviated from expected roles and responsibilities during the transient.

In addition to the failures by the Millstone Unit 2 control room crew to implement written procedures, the unplanned reactor power transient event was further exacerbated by the lack of written procedures for operation of the reactor protection system and for specific actions for power operation and transients involving multiple reactivity additions. Specific examples of these failures are provided below:

- a. At the onset of the event, the RPS VHT setpoints were below 96 percent. During the turbine transient, reactor power increased toward the VHT setpoints. The Reactivity SRO observed the illumination of the VHT setpoint reset permissive lights (one light per RPS channel), and incorrectly assumed they were illuminating due to minor power fluctuations associated with the fission product poison increase and on-going dilution. Consequently, he increased the margin to the trip setpoint by resetting the VHT setpoints upward four times during the power rise. If the SRO had not reset the VHT, the RPS would have automatically initiated a high power reactor trip due to the magnitude of the power increase from 88 percent to 96 percent. In addition to preventing the automatic trip, the Reactivity SRO did not understand or question why reactor power was increasing, and did not inform anyone on the crew of his actions to reset the VHT setpoints. The inspection team reviewed existing

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station procedures, and determined that there was no procedural prohibition for resetting the VHT setpoint under any conditions.

- b. During the turbine steam flow increase power transient event (which introduced positive reactivity to the reactor), the crew also added positive reactivity by 1) an on-going RCS dilution, 2) opening a turbine bypass valve, and 3) withdrawing control rods. The inspection team identified that station reactivity management procedures did not provide adequate guidance regarding multiple, concurrent, positive reactivity additions during power operations.

Analysis: The performance deficiency was the failure of Millstone personnel to carry out their assigned roles and responsibilities and poor reactivity management during main turbine control valve testing, which contributed to the unanticipated reactor power increase. Specifically, the Millstone Unit 2 operations crew failed to implement written procedures that delineated appropriate authorities and responsibilities for safe operation and shutdown and a procedure for controlling reactor reactivity. In addition, the licensee failed to establish written procedures for the RPS VHT setpoint reset and for power operation and transients involving multiple reactivity additions. Multiple factors contributed to this deficiency; however, the primary cause was ineffective reinforcement of Dominion standards and expectations. Traditional enforcement does not apply since there were no actual safety consequences, impacts on the NRC's ability to perform its regulatory function, or willful aspects to the finding.

The finding is more than minor because the finding was associated with the Human Performance attribute of the Initiating Events cornerstone and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Additionally, the PD could be viewed as a precursor to a significant event. Because the finding primarily involved human performance errors, probabilistic risk assessment tools were not well suited for evaluating its significance. The team determined that the criteria for using IMC 0609, Appendix M, "Significance Determination Process Using Qualitative Criteria," were met, and the finding was evaluated using this guidance as described in Attachment 4 to this report. Based on the qualitative review of this finding, regional management concluded the finding was preliminarily of low to moderate safety significance (preliminary White). The completed Appendix M table is attached (Attachment 4). There were no immediate safety concerns following the transient because the event itself did not result in power exceeding license limits or fuel damage. Additionally, interim corrective actions were taken, which included removing the Millstone Unit 2 control room crew involved in the transient from operational duties pending remediation, and establishment of continuous management presence in the Millstone Unit 2 control room while long term corrective actions were developed.

This finding had a cross-cutting aspect in the Human Performance cross-cutting area, Decision Making component, because Dominion licensed personnel did not demonstrate adequate operational decision-making, especially when faced with uncertain or unexpected plant conditions. This includes formally defining the authority and roles for decisions affecting nuclear safety, communicating these roles to applicable personnel, and implementing these roles and authorities as designed [H.1(a)].

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Enforcement: The team identified two apparent violations of Technical Specification 6.8, "Procedures," which states, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Appendix "A" of Regulatory Guide (RG) 1.33, February, 1978. Regulatory Guide 1.33, Appendix "A," Paragraph 1, "Administrative Procedures," requires written procedures for authorities and responsibilities for safe operation and shutdown as well as general plant operating procedures appropriate for power operation and transients. Regulatory Guide 1.33, Appendix A, Paragraph 3, "Procedures for Startup, Operation, and Shutdown of Safety-Related PWR Systems," requires, in part, written procedures for changing modes of operation, as appropriate, for the reactor control and protection system. Regulatory Guide 1.33, Appendix A, Paragraph 5, "Procedures Abnormal, Off-normal, or Alarm Conditions," requires, in part, written procedures for other expected transients that may be applicable.

The first apparent violation involved the failure of the Millstone Unit 2 control room crew to implement written procedures that delineated appropriate authorities and responsibilities for safe operation and shutdown and a procedure for controlling reactor reactivity. As noted in the Description section above, on February 12, 2011, the seven operators in the control room (4 SROs, 2 ROs and 1 non-licensed operator) inadequately implemented Dominion procedures for authorities and responsibilities for safe operation and shutdown during the performance of main turbine control valve testing. The inappropriate actions of the operators directly contributed to an unanticipated 8 percent increase in Millstone Unit 2 reactor power.

The second apparent violation involved the licensee's failure to establish written procedures for the RPS VHT setpoint reset and for power operation and transients involving multiple reactivity additions. As noted in the Description section above, on February 12, 2011, Dominion did not have written procedures regarding operation of the Millstone Unit 2 VHT setpoint reset pushbuttons (a part of the reactor protection system) during steady-state or plant transient conditions. As a result, during the unanticipated plant transient on February 12, 2011, a Millstone Unit 2 SRO reset the VHT setpoint a total of four times without adequate guidance from a plant procedure, thereby prohibiting the automatic trip that would have occurred, had the VHT setpoint not been reset. Additionally, Dominion did not have an adequate written procedure related to reactivity control regarding multiple concurrent positive reactivity additions during at-power operations. Specifically, during the unanticipated reactor transient event, three separate positive reactivity additions occurred (RCS dilution, manual opening of a turbine bypass valve, and manual withdrawal of control rods), and the existing procedures did not provide guidance to address this situation.

Following review of the event, the licensee documented the condition in the corrective action process (CR 413602). Immediate corrective actions included removal of the Millstone Unit 2 control room crew involved in the transient from operational duties pending remediation, issuance of a Standing Order regarding VHT setpoint reset, and establishment of continuous management presence in the Millstone Unit 2 control room while long term corrective actions were developed.

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Pending determination of final safety significance, this finding with the associated apparent violations will be tracked as **AV 05000336/2011008-01, Multiple Examples of Procedural Violations and Inadequate Procedures Relating to Control Room Crew Performance During a Plant Transient.**

## 2.2 Turbine Operation

### a. Inspection Scope

The team interviewed the control room personnel that were directly involved with the turbine load increase during the February 12, 2011, unanticipated reactor transient event. The team also reviewed narrative logs, sequence of events and alarm printouts, condition reports, PPC trend data, procedures implemented by the crew, and procedures regarding roles and responsibilities of operations personnel.

### b. Findings/Observations

#### Improper Operation of Turbine Control Valves During Testing

Introduction: The inspectors identified a self-revealing finding of very low safety significance (Green) for improper operation of the Millstone Unit 2 turbine controls during turbine control valve testing. Specifically, the inspectors identified that Millstone Unit 2 control room operators failed to correctly implement surveillance procedure SP-2651N, "Main Control Valve Testing." Incorrect operation of the turbine controls contributed to an unplanned reactor power increase from 88 percent to 96 percent.

Description: On February 12, 2011, the Millstone Unit 2 control room operators incorrectly performed step 4.1.13.c of SP-2651N while conducting main turbine control valve testing. This step required the operator to use the turbine load selector pushbutton to maintain turbine first stage pressure within  $\pm 10$  psig of the initial pressure for the current power level, 88 percent. However, in response to an increasing trend in first stage pressure, the control operators improperly selected "INCREASE" on the turbine load set selector pushbutton instead of "DECREASE". This action caused the turbine control valve to further open and compounded the increasing trend in turbine first stage pressure. The control operators pushed the "INCREASE" pushbutton a total of four times before the operators recognized that they should have, instead, pressed the "DECREASE" pushbutton. The operators subsequently took action to stop the power increase and stabilize the plant by depressing the "DECREASE" push button twice. The unexpected turbine load increase resulted in a plant transient, raising reactor power from 88 percent to 96 percent before power was stabilized.

The STA conducted peer checking for the control operator during the control valve testing evolution and the US closely supervised the operation of the turbine controls. Both individuals failed to identify or correct the mis-operation of the turbine load selector. All three operators then failed to communicate the extent of the plant transient to the SM which contributed to additional human performance errors, thereby exacerbating the plant transient.

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Analysis: The team determined that the control room operator's failure to correctly implement step 4.1.13.c of SP-2651N was a performance deficiency. The cause of this performance deficiency was reasonably within Dominion's ability to foresee and correct to ensure proper operator response during turbine control valve testing. Traditional enforcement does not apply since there were no actual safety consequences, impacts on the NRC's ability to perform its regulatory function, or willful aspects to the finding. The finding is more than minor because it was similar to NRC Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," Example 4b, in that the incorrect operation of the turbine load selector pushbutton caused a plant transient.

The finding was associated with the Human Performance attribute of the Initiating Events cornerstone and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Specifically, the mis-operation of the turbine load selector upset plant stability by causing a plant transient that raised reactor power from 88 percent to 96 percent. The inspectors conducted a Phase 1 screening in accordance with NRC IMC Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," and determined that the finding was of very low safety significance (Green) because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available.

The inspectors determined that this finding had a cross-cutting aspect in the Human Performance cross-cutting area, Resources component, because Dominion did not provide adequate training of personnel and sufficient qualified personnel [H.2(b)]. The just-in-time training (JITT) for turbine control valve testing had not adequately prepared the control room operators to respond to a change in turbine first stage pressure. In addition, the use of the STA for peer checking, although not prohibited by plant administrative procedures, had been previously identified during recent (May 2010) licensed operator requalification training in plant-specific operating experience as being a contributing cause for a plant transient during control valve testing on Unit 3 in 2007. Nevertheless, the shift allowed the STA, who was not licensed, to be the peer checker for this evolution in place of a qualified licensed reactor operator.

Enforcement: This finding does not involve enforcement action because no regulatory requirement violation was identified. Dominion entered this issue into their corrective action program (CR415094) and conducted an RCE to determine corrective actions to prevent recurrence. Because this finding does not involve a violation of regulatory requirements and has very low safety significance, it is identified as **FIN 05000336/2011008-02, Improper Operation of Turbine Control Valves During Testing.**

### 3. Organizational Response

#### 3.1 Immediate Response

##### a. Inspection Scope

The team interviewed personnel, reviewed various procedures and records, and observed control room operations to assess immediate response of station personnel to the unanticipated reactor power transient event.

##### b. Findings

No findings of significance were identified.

The team noted that Dominion's initial response to the event was not appropriately thorough and timely, did not highlight the significance of the unplanned power increase and reactivity control issues, and was narrowly focused. Following post-event plant stabilization, a crew brief was conducted to assure good common understanding of transient and to determine whether testing should proceed. However, the crew did not identify the many human performance issues during the event, including control rod withdrawal, VHT reset, steam dump operation, multiple communication errors, and incorrect transient diagnoses.

Initially, Dominion personnel incorrectly concluded that Unit 2 reactor power increased by four percent (rather than the actual eight percent) during the transient. This extent of power increase was challenged during immediate post-event discussions between Dominion managers, but the Dominion management team did not correctly identify the extent of the power rise until the following day. Based on an incomplete and inaccurate initial assessment of the event, Crew D was allowed to complete the test, return power to 100% and stand an additional shift in the control room the following day before Dominion management removed them from operating duties. Although all of Crew D was off-shift the following week (per normal shift rotation), two of the individuals involved in the human performance errors were not formally disqualified from watchstanding until several days after the event, after NRC questioned Dominion's basis for not disqualifying those individuals. As of two weeks after the event, Dominion had only generated two condition reports related to the event and these two condition reports did not address all identified deficiencies related to the event. See the detailed sequence of events (Attachment 3).

Millstone Operations department management issued a new standing order related to VHT setpoint reset. However, a number of weeks elapsed before operating procedures were revised to provide updated approved plant procedures for the VHT setpoint operation.

### 3.2 Post-Event Root Cause Evaluation and Actions

#### a. Inspection Scope

The team reviewed Millstone's RCE Report for the unanticipated reactor power transient event to determine whether the causes of the event and associated human performance issues were properly identified. Additionally, the team assessed whether interim and planned long term corrective actions were appropriate to address the cause(s).

#### b. Findings

No findings of significance were identified.

The RCE was thorough and appeared to identify all underlying causal factors. The associated proposed corrective actions appeared to adequately address the underlying causal factors. Dominion identified the root cause as an ineffective crew performance management program. The identified contributing causes and issues included:

- Improper implementation of standards and fundamental work practices by the crew;
- Operator knowledge weakness related to understanding main turbine operation;
- Inadequate guidance for VHT setpoint reset;
- Inadequate pre-job briefs;
- Inadequate just-in-time training;
- Weaknesses in test procedure guidance for controlling first stage pressure; and
- Lack of guidance on control of multiple concurrent reactivity additions.

### 4OA6 Meetings, Including Exit

#### Exit Meeting Summary

On April 14, 2011, the team discussed the inspection results with Mr. A. J. Jordan, Site Vice President, and members of his staff. The team confirmed that proprietary information reviewed during the inspection period was returned to Dominion.

**SUPPLEMENTAL INFORMATION****KEY POINTS OF CONTACT**Dominion Personnel

L. Armstrong	Manager, Training
D. Bajumpaa	Nuclear Safety Analyst
B. Bartron	Supervisor, Licensing
C. Chapin	Assistant Operations Manager
W. Chesnut	Supervisor Nuclear Shift Operations Unit 2
S. Claffey	Reactor Engineer
T. Cleary	Licensing Engineer
G. Closius	Licensing Engineer
K. Grover	Manager, Operations
J. Hampton	Simulator Tester
A. Jordan	Site Vice President
R. MacManus	Director, Nuclear Station Safety & Licensing
G. Marshall	Manager, Outage and Planning
H. McKenney	Supervisor Shift Operations Support
J. Riley	Lead Instructor – Unit 2 Operator Requalification Training
R. Riley	Supervisor of Nuclear Shift Operations Unit 3
J. Semancik	Plant Manager
C. Tan	Simulation Engineer
C. Zorn	Turbine System Engineer

Others

D. Galloway	Program Supervisor, Connecticut Department of Environmental Protection, Bureau of Air Management, Radiation Division
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**LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**Opened

05000336/2011008-01	AV	Multiple Examples of Procedural Violations and Inadequate Procedures Relating to Control Room Crew Performance During a Plant Transient (Section 2.1)
05000336/2011008-02	FIN	Improper Operation of Turbine Control Valves During Testing (Section 2.2)

**LIST OF DOCUMENTS REVIEWED**Condition Reports (CR)

CR413602	CR415089	CR415096
CR415944	CR415091	CR415097
CR415087	CR415094	CR415104

**SUPPLEMENTAL INFORMATION**Standing Order

SO-11-04 (Relating to VHT setpoint reset)

Procedures

MP-PROC-OPS-SP 2651N, "Main Control Valve Operability Test," Rev 004-03

MP-PROC-OPS-OP 2204, "Load Changes," Rev 023-06

MP-PROC-000-AD-AA-102, "Procedure Use and Adherence," Rev 4

MP-PROC-OPS-OP 2304C, "Make Up (Boration and Dilution) Portion of CVCS," Rev 023-03

MP-PROC-000-OP-AA-100, "Conduct of Operations," Rev 11

MP-PROC-000-OP-AP-300, "Reactivity Management," Rev 11

MP-PROC-000-OP-AA-106, "Infrequently Conducted or Complex Evolutions," Rev 5

MP-GARDMP-000-OP-AA-1800, "Operator Fundamentals," Rev 2

Miscellaneous

Control Room Operations Narrative Logs

Unit 2 Sequence of Events Recorder Printout for February 12, 2011

Unit 2 Alarm History Printout for February 12, 2011

Root Cause Evaluation

Root Cause Evaluation RCE 001044, "Unplanned 8% Reactor Power Excursion"

**LIST OF ACRONYMS**

ADAMS	Agency-wide Documents Access and Management System
AV	Apparent Violation
BOP RO	Balance of Plant Reactor Operator
CFR	Code of Federal Regulations
CR	Condition Report
CV	Control Valve
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
HEP	Human Error Probability
IMC	Inspection Manual Chapter
JITT	Just in Time Training
MT	Main Turbine
MW	Megawatt
NRC	Nuclear Regulatory Commission
OATC RO	Operator at the Controls Reactor Operator
OMOC	Operations Manager on Call
PARS	Publicly Available Records
PD	Performance Deficiency
PPC	Plant Process Computer
PRA	Probabilistic Risk Assessment
psig	pounds per square inch gauge
RCE	Root Cause Evaluation
RCS	Reactor Coolant System
RE	Reactor Engineer

**SUPPLEMENTAL INFORMATION**

RG	Regulatory Guide
RO	Reactor Operator
RPS	Reactor Protection System
SDP	Significance Determination Process
SM	Shift Manager
SRO	Senior Reactor Operator
SIT	Special Inspection Team
STA	Shift Technical Advisor
TS	Technical Specification
US	Unit Supervisor
VCT	Volume Control Tank
VHT	Variable High Power Trip

**SPECIAL INSPECTION TEAM CHARTER**

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

**SPECIAL INSPECTION TEAM CHARTER**

February 18, 2011

**MEMORANDUM TO:** Samuel L. Hansell Jr., Manager  
Special Inspection Team

Peter A. Presby, Leader  
Special Inspection Team

**FROM:** Peter R. Wilson, Acting Director **/RA/**  
Division of Reactor Safety

Darrell J. Roberts, Director **/RA/**  
Division of Reactor Projects

**SUBJECT:** SPECIAL INSPECTION TEAM CHARTER -  
MILLSTONE POWER STATION UNIT 2 OPERATOR  
PERFORMANCE DURING MAIN TURBINE CONTROL VALVE  
TESTING ON FEBRUARY 12, 2011

In accordance with Inspection Manual Chapter (IMC) 0309, "Reactive Inspection Decision Basis for Reactors," a Special Inspection Team (SIT) is being chartered to evaluate operator performance and organizational decision-making during a Millstone Power Station Unit 2 main turbine control valve test on February 12, 2011. The decision to conduct this special inspection was based on meeting the deterministic criteria (involved questions or concerns pertaining to licensee operational performance) specified in Enclosure 1 of IMC 0309, and in accordance with Section 04.04, "Additional Factors That May Warrant an IIT, AIT, or SIT." The risk associated with this event was not amenable to probabilistic risk analysis. The absence of a calculable increase in conditional core damage probability (CCDP) is based upon the inability to reasonably and accurately approximate the human performance reliability attributes associated with the operator performance that precipitated the unanticipated reactor power level changes. IMC 0309, Section 04.04 states that, "factors such as openness, public interest, and public safety should be appropriately considered by NRC when deciding whether to dispatch an IIT, AIT, or SIT."



## **SPECIAL INSPECTION TEAM CHARTER**

The SIT will expand on the inspection activities started by the resident inspectors and augmented by a Division of Reactor Safety (DRS) inspector who was dispatched to the site soon after the event. The Team will review the causes of the event, and Dominion's organizational and operator response during the event. The Team will perform interviews, as necessary, to understand the scope of operator actions performed during the event. The Team will also assess whether the SIT should be upgraded to an Augmented Inspection Team in accordance with IMC 0309.

The inspection will be conducted in accordance with the guidance contained in NRC Inspection Procedure 93812, "Special Inspection," and the inspection report will be issued within 45 days following the final exit meeting for the inspection.

The special inspection will commence on February 22, 2011. The following personnel have been assigned to this effort:

Manager:	Samuel L. Hansell, Jr., Branch Chief Operations Branch, DRS, Region I
Team Leader:	Peter A. Presby, Senior Operations Engineer Operations Branch, DRS, Region I
Team Members:	Brian C. Haagensen, Millstone Power Station Resident Inspector Division of Reactor Projects (DRP), Region I  Brian J. Fuller, Operations Engineer Operations Branch, DRS, Region I

Enclosure: Special Inspection Team Charter

**SPECIAL INSPECTION TEAM CHARTER****Special Inspection Team Charter  
Millstone Power Station  
Unit 2 Operator Performance During Main Turbine Control Valve  
Testing on February 12, 2011****Background:**

Based on preliminary information, the following is a description of the event. On Saturday, February 12, 2011, Millstone Power Station Unit 2 reduced power to 88 percent for main turbine control valve testing. In preparation for the test, Dominion procedure SP 2651N, "Main Control Valve Operability Test," provides written instructions for the operators to slowly rotate the turbine first stage pressure feedback potentiometer from the "OUT" to the "IN" position over a one minute period while maintaining turbine first stage pressure by using the "LOAD SELECTOR INCREASE and DECREASE" pushbuttons. As the Balance of Plant (BOP) Reactor Operator (RO) rotated the turbine first stage pressure potentiometer, turbine first stage pressure and reactor power increased. The BOP RO incorrectly went to increase instead of decrease on the load selector button. When he did not get the desired response, he pressed the increase button at least two more times. The Shift Technical Advisor, who was acting as both the peer checker and the Control Room Supervisor directing the evolution, did not apparently detect the incorrect manipulation and did not correct the BOP RO. The increased steam demand lowered reactor coolant average temperature (Tavg) and caused a power increase to 96 percent power over 90 seconds. While the transient was occurring, the Variable Over Power Trip (VOPT) reset lights were illuminated. The crew reset the VOPT several times during the event.

The Shift Manager recognized that a transient was occurring and directed the BOP RO to stop his actions. He directed the reactivity Senior Reactor Operator to withdraw control rods four steps to stabilize Tavg while temperature was decreasing, an action that compounded the power increase. After Tavg and reactor power were stabilized, the main turbine control valve test was completed and Unit 2 was returned to 100 percent power.

Currently, Millstone Unit 2 is in Mode 1 at normal operating pressure and temperature. There was no impact to Unit 3. Dominion is currently investigating the operators' response to this event. Additionally, Dominion has suspended the qualifications of the operations crew while the investigation continues. The NRC resident inspectors and a DRS senior operations engineer have provided follow-up to this event under the Reactor Oversight Process (ROP) baseline inspection program.

**Basis for the Formation of the SIT:**

The IMC 0309 review concluded that one of the deterministic criteria was met due to questions or concerns pertaining to licensee operational performance. This criterion was met based on human performance errors that occurred and led to the unanticipated reactor power excursion. The human performance errors included:

- Depressing the increase button on the load selector instead of decrease;
- Inadequate self and peer checking;
- The addition of positive reactivity (control rod withdrawal) while reactor power was already increasing, without understanding the nature of the transient;

## SPECIAL INSPECTION TEAM CHARTER

- Manipulating control rods while in an oversight/supervisory role; and
- Resetting the VOPT setpoint during a transient, without understanding the nature of the transient.

In accordance with IMC 0309, the event was evaluated for risk significance because one deterministic criterion was met. However, the risk associated with this event was not amenable to probabilistic risk analysis. The absence of a calculable increase in conditional core damage probability (CCDP) is based upon the inability to reasonably and accurately approximate the human performance reliability attributes associated with the operator performance that precipitated the unanticipated reactor power level changes.

IMC 0309, Section 04.04 states that, "factors such as openness, public interest, and public safety should be appropriately considered by NRC when deciding whether to dispatch an IIT, AIT, or SIT." In light of the aforementioned human performance errors, and consistent with Section 4.04, Region I has decided to initiate an SIT.

### **Objectives of the Special Inspection:**

The Team will review the causes of the event, and Dominion's organizational and operator response during the event. The Team will perform interviews, as necessary, to understand the scope of operator actions performed during the event.

To accomplish these objectives, the team will:

1. Develop a complete sequence of events including follow-up actions taken by Dominion, and the sequence of communications within Dominion and to the NRC subsequent to the event;
2. Review and assess crew operator performance and crew decision making, including their adherence to expected roles and responsibilities, including the command and control function associated with reactivity manipulations, the use of procedures, log keeping, and overall communications;
3. Evaluate the extent of condition with respect to the other crews;
4. Determine the appropriateness and safety significance of resetting the VOPT setpoint during this event;
5. Evaluate the effectiveness of supervisory oversight of Senior Reactor Operators (SROs) in light of the on-duty Shift Manager directing the Reactivity Oversight SRO to manipulate control rods while in the oversight role;
6. Review and assess the effectiveness of Dominion's response to this event and corrective actions taken to date. This includes overall organizational response, the root cause evaluation, and adequacy of immediate, interim and proposed long-term corrective actions;

**SPECIAL INSPECTION TEAM CHARTER**

7. Review the adequacy of operator requalification training as it relates to this event, including the integration of newly licensed operators into the operator requalification training program;
8. Assess the decision making and actions taken by the operators to determine if there are any implications related to the site's safety culture;
9. Evaluate\_ Dominion's application of pertinent industry operating experience, including INPO SOER 1Q-2, "Engaged, Thinking Organizations," to assess the effectiveness of any actions taken in response to the operating experience; and
10. Document the inspection findings and conclusions in a Special Inspection Team final report within 45 days of inspection completion.

**Guidance:**

Inspection Procedure 93812, "Special Inspection", provides additional guidance to be used by the SIT. Team duties will be as described in Inspection Procedure 93812. The inspection should emphasize fact-finding in its review of the circumstances surrounding the event. Safety concerns identified that are not directly related to the event should be reported to the Region I office for appropriate action.

The team will conduct an entrance meeting and begin the inspection on February 22, 2011. While on-site, the Team Leader will provide daily briefings to Region I management, who will coordinate with the Office of Nuclear Reactor Regulation, to ensure that all other pertinent parties are kept informed. The Team will also coordinate with the Region / State Liaison Officer to implement the Memorandum of Understanding between the NRC and the State of Connecticut to offer observation of the inspection by representatives of the state. A report documenting the results of the inspection will be issued within 45 days following the final exit meeting for the inspection.

Before the end of the first day onsite, the Team Manager shall provide a recommendation to the Regional Administrator as to whether the SIT should continue or be upgraded to an Augmented Inspection Team response.

This Charter may be modified should the team develop significant new information that warrants review.

## DETAILED SEQUENCE OF EVENTS

### February 12, 2011 Power Transient Event

The team constructed the sequence of events from a review of Control Room narrative logs, plant process computer (PPC) data (alarm printout, sequence of event printout, plant parameter graphs) and plant personnel interviews.

<b>MILLSTONE UNIT 2 EVENT TIMELINE</b>		
Clock Time [date] (hr:mm:ss)	Event Time	Description
2/10/11		Operations Crew D attends four hour simulator just-in-time training session to prepare for scheduled quarterly main turbine (MT) valve testing. Partial evolution pre-job brief conducted.
2/12/11 06:00		Operations Crew D assumes the day shift watch. Unit 2 is in MODE 1, 100% reactor power.
07:50		Quarterly main turbine (MT) stop valve testing complete.
08:33		Pre-job briefing for the downpower, MT control valve (CV) testing, and up-power. Personnel in attendance for brief, and also throughout the downpower and control valve testing: <ul style="list-style-type: none"> <li>➤ A Shift Manager-qualified individual assigned by operations management to provide oversight for the reactivity evolutions</li> <li>➤ The crews' Shift Manager (SM)</li> <li>➤ Unit Supervisor (US)</li> <li>➤ Reactivity SRO (normally the crew's work control supervisor)</li> <li>➤ RO assigned as Operator at the Controls Reactor Operator (OATC RO)</li> <li>➤ RO assigned as Balance of Plant Reactor Operator (BOP RO)</li> <li>➤ Shift Technical Advisor (STA)</li> <li>➤ Reactor Engineer (RE)</li> </ul>
08:59		Commence downpower for MT valve testing per reactivity plan.
10:15		Stabilize plant at 88% power, following 173 gallons boration, control rod insertion from 180 steps to 158 steps and turbine load reduction using load limit.
10:35		102 gallon dilution to maintain steady Reactor Coolant System (RCS) temperature during build-in of fission product poisons.
10:44		100 gallon dilution.
10:53		150 gallon dilution.
11:02		150 gallon dilution.
11:06		OATC RO begins 600 gallon dilution.

## DETAILED SEQUENCE OF EVENTS

MILLSTONE UNIT 2 EVENT TIMELINE		
Clock Time [date] (hr:mm:ss)	Event Time	Description
11:19		BOP RO shifts turbine load control from Load Limit to Load Set.
11:20		OATC RO adjusts turbine bypass valve setpoint to open 'A' turbine bypass valve to 10% open. BOP RO adjusts main turbine load to maintain RCS temperature. US, BOP RO and STA discuss and jointly agree on a planned action, to depress the Load Set INCREASE button, if 1 <sup>st</sup> stage pressure increases while placing 1 <sup>st</sup> stage pressure feedback in service.
11:24:42		Start letdown diversion to waste to lower VCT level 89% to 79%.
11:26:15		BOP RO, with peer checks from STA and direct observation by US, begins to place 1 <sup>st</sup> stage feedback in service and depresses INCREASE pushbutton multiple times in response to rising 1 <sup>st</sup> stage pressure.
11:26:32	0	Control valves begin opening. Beginning of transient. Conditions: RCS Tcold 542.8°F, MT CV position 38.1% open. MT first stage pressure 476 psig.
11:26:44	12 sec	RCS Tcold is decreasing.
11:27:34	1 min, 2 sec	'A' turbine bypass valve fully closes.
11:27:56	1 min, 24 sec	Reactivity SRO resets Channel A Variable High Power Trip (VHT).
~ 11:28:00	1 min, 28 sec	SM directs OATC RO to lower turbine bypass valve setting to re-open 'A' turbine bypass valve. Tcold approximately 541.5°F.
11:28:02	1 min, 30 sec	600 gallon dilution is complete.
11:28:18	1 min, 46 sec	OATC RO adjusts 'A' turbine bypass valve setpoint. Valve opens to 2% open position for approximately 6 seconds and then recloses automatically.
11:28:40	2 min, 8 sec	Reactivity SRO resets Channel A VHT (2 <sup>nd</sup> time during transient).
~ 11:28:40	2 min, 8 sec	SM directs US to return to position of oversight, away from the turbine control panel.
11:28:40	2 min, 8 sec	Turbine 1 <sup>st</sup> stage pressure is about 524 psig, up from 476 psig prior to transient. US recalled later that at this point the Load Set INCREASE pushbutton had been depressed 4 times and the Load Set DECREASE pushbutton had been depressed 2 times.
11:28:44	2 min, 12 sec	Reactivity SRO withdraws Group 7 Control Element Assemblies (control rods) 4 steps per SM direction. Tcold approximately 538.7°F. Neither SM nor Reactivity SRO are aware of turbine load increase and temperature transient in progress.
11:29:14	2 min, 42 sec	Turbine load stabilizes at new setpoint on Load Set. Control valves reach maximum open during transient at 70.5% open position.
11:29:18	2 min, 46 sec	Reactivity SRO resets Channel A VHT (3 <sup>rd</sup> time during transient).

## DETAILED SEQUENCE OF EVENTS

MILLSTONE UNIT 2 EVENT TIMELINE		
Clock Time [date] (hr:mm:ss)	Event Time	Description
11:29:28	2 min, 56 sec	Tcold reaches minimum during transient at 537.5°F. Minimum pressurizer pressure is 2238 psia.
11:29:32	3 min, 0 sec	Reactivity SRO resets Channel A VHT (4 <sup>th</sup> time during transient). Reactor power stabilized at ~96%.
11:30:56		Stop letdown diversion to waste.
11:31:56		BOP RO shifts turbine load control from Load Set to Load Limit.
11:32:18		Reactivity SRO resets Channel A VHT.
11:35:52		Reactivity SRO resets Channel A VHT.
~11:37		Turbine load gradually reduced by the operator to restore RCS Tcold to program value.
~11:50		Turbine load stabilized at pre-event level.
~12:00	34 min	SM calls his immediate supervisor (Senior Unit 2 Licensed Individual). The SM characterizes the event as a 4% increase in reactor power. After discussion, both agree, okay to complete MT CV testing.
12:18		Turbine load control transferred to Load Set.
~12:30		SM calls immediate supervisor again. During this call, discussion reveals SM mistakenly believed the SM-qualified individual assigned by operations management to provide oversight for the reactivity evolutions, who was in the control room, was fulfilling the roll of Operations Manager on Call (OMOC). The immediate supervisor directed the SM to inform the actual OMOC of the event.
12:33		Recommended main turbine control valve stroking satisfactorily.
~12:40	1 hr, 14 min	SM briefs OMOC on the event (estimated time from SM recollection).
12:55	1 hr, 29 min	OMOC informs Assistant Operations Manager.
12:56		Completed main turbine control valve stroking.
~13:04	1 hr, 38 min	Assistant Operations Manager calls Operations Manager.
13:06		BOP RO returns turbine load control to Load Limit.
~13:25	2 hrs	Management conference call between Plant Manager, Operations Manager, Assistant Operations Manager, SM, Operations Management oversight person on shift. Discussed event as understood at the time (single human performance error associated with turbine load increase button causing a 4% power increase). Decided to have SM meet with mgmt team following morning to fully debrief on the occurrence. Rearranged watch bill to accommodate SM debrief.

### DETAILED SEQUENCE OF EVENTS

<b>MILLSTONE UNIT 2 EVENT TIMELINE</b>		
<b>Clock Time [date] (hr:mm:ss)</b>	<b>Event Time</b>	<b>Description</b>
~15:15	3.8 hrs	Another operations management conference call (estimated time/details from Assistant Operations Manager recollection) between Ops Manager, Assistant Ops Manager, OMOC, the other two senior Unit 2 ops mgmt licensed individuals and a SM not currently on shift. Decided to have the on-shift SM meet with mgmt team following morning (2/13/2011) to fully debrief on the occurrence. Rearranged the dayshift watch bill to accommodate SM debrief. A reactor engineer was assigned during the evening shift to review event data for use the following day in reconstruction of the occurrence.
15:38		Crew D commences power increase to return Unit 2 to full power.
17:05	5.5 hrs	The OMOC contacts one of the NRC Resident Inspectors and informs him of a human performance error during valve testing which resulted in approximately 4% power rise, with no reactor trip, no safety limits exceeded and that Dominion would be investigating further tomorrow.
17:45		Unit 2 returned to 100% reactor power.
~18:00		Crew D relieved by on-coming night shift crew.
23:05	11.5 hrs	Reactor engineering email to Operations management team, containing Unit 2 plant process computer data and summary identifying transient details of 8% power change magnitude (not 4% as originally characterized), inappropriate rod withdrawal, and variable high power trip setpoint resets.
2/13/11 ~06:00		Crew D assumes the dayshift watch from the night shift crew.
2/13/11 ~15:00	27.5 hrs	Ops Manager and Assistant Operations Manager update the NRC Senior Resident Inspector that event was more serious than originally realized, Station management considering pulling the crew off-shift and a senior operations management licensed individual observing remainder of dayshift operations until Crew D is relieved at 18:00.
2/13/11 ~18:00		Crew D relieved by on-coming night shift crew.
2/14/11 ~10:00	46.5 hrs	Operations Manager informs NRC resident staff that Crew D qualifications have been suspended. Crew will meet with management to analyze the event to evaluate the exhibited performance issues.



**IMC 0609, APPENDIX M, TABLE 4.1**

## Qualitative Decision-Making Attributes for NRC Management Review

1. The SDP is the preferred path for determining the significance of findings in the Reactor Oversight Process.
2. IMC 0609 Appendix M is provided for use when the existing SDP guidance is not adequate to provide a reasonable estimate of the significance.
3. IMC 0609 Appendix M could be used for this case. Appendix M utilizes a qualitative significance determination process focused on the below table where 6 of 8 attributes have some level of applicability.

<b>Decision Attribute</b>	<b>Applicable to Decision?</b>	<b>Basis for Input to Decision – Provide qualitative and/or quantitative information for management review and decision making.</b>
Finding can be bounded using qualitative and/or quantitative information?	No	<p>The at-power safety significance determination process, IMC 0609 Appendix A, quantitative analysis methodology is not adequate to provide reasonable estimates of the finding's significance. That SDP does not model errors of commission and does not provide a method of accurately estimating changes to the human error probabilities caused by errors of omission. As a result, no quantitative risk evaluation can be performed for this finding.</p> <p>Human errors have the potential to increase the human error probability (HEP) for credited operator actions. The probabilistic risk assessment models are highly sensitive to small variations in HEP changes. The existing PRA research does not currently support a method for varying the performance shaping factors in response to defined error forcing contexts. It is not possible to calculate a valid single point risk estimate. Human performance is a very large contributor to PRA uncertainty.</p>
Defense-in-Depth affected?	Yes	<p>The term "defense in depth" is commonly associated with the maintenance of the integrity and independence of the three fission product barriers. The fission product barriers were not actually compromised by the actions of the crew during this event. While the Reactivity SRO reset the VHT and prevented a reactor trip from occurring, a reactor trip was not actually required to protect the core during this event. The fuel barrier was not actually jeopardized by the crew's actions.</p> <p>On the other hand, the crew plays a vital role in the</p>

IMC 0609, APPENDIX M, TABLE 4.1

Decision Attribute	Applicable to Decision?	Basis for Input to Decision – Provide qualitative and/or quantitative information for management review and decision making.
		<p>maintenance of defense in depth from the perspective that they operate station controls. Human errors have the potential to compromise the three fission product barriers. The commission of multiple unforeseen human errors in a short period of time during the turbine valve testing was clearly related to a loss of situational awareness and a failure to maintain the roles and responsibilities assigned under the Dominion administrative procedures.</p>
Performance Deficiency effect on the Safety Margin maintained?	Yes	<p>Plant safety analyses credit the variable high-power trip setpoint for some events when determining bounding cases. The Final Safety Analysis Report Chapter 14 safety analysis considers a similar event (a 10% power increase from a turbine control valve failing full open at 100% power) that actually bounds this event where the core is protected from fuel damage.</p> <p>Operator response to this event reduced the margin to the reactor trip setpoint. Operators unintentionally raised turbine load and then, in response, intentionally opened a turbine bypass valve, raised the VHT setpoints and withdrew control rods.</p> <p>However, the flux distribution remained bounded by the safety analysis and RPS actuation was not actually needed to prevent exceeding the departure from nucleate boiling or fuel centerline temperature design limits.</p> <p>Operator action, post-event interviews and lack of procedural guidance for VHT reset all indicate likelihood that other Unit 2 operators may have similarly reset VHT when a reset permissive light illuminates during power transient events where the underlying cause is not immediately apparent. Under different circumstances, there is potential for exceeding acceptable fuel design limits if the VHT were reset during an event with a higher magnitude steam flow increase and core peaking factors closer to operating limits. However, the potential for the event to progress to a core damage state due to operators incorrectly and continually resetting the VHT is unlikely because redundant reactor trips (thermal margin/low pressure</p>

IMC 0609, APPENDIX M, TABLE 4.1

Decision Attribute	Applicable to Decision?	Basis for Input to Decision – Provide qualitative and/or quantitative information for management review and decision making.
		and local power density trips) would limit the power increase.
The extent the performance deficiency affects other equipment.	Yes	<p>The failure of the Unit 2 crews to remain within their assigned roles and responsibilities has the potential to affect the operation of equipment that requires operator manual action to function. Other Unit 2 crews displayed a degree of degraded performance in the area of conduct of operations based on post-event assessment.</p> <p>Dominion documented a number of post-event issues related to human performance by the other Unit 2 operating crews. These issues were observed by licensee management personnel during the three week period immediately following the power transient event and demonstrate the pervasiveness of the performance lapses of the Unit 2 control room operators. Improper procedure use and improper peer checking were readily identified behaviors on multiple Unit 2 crews. Ineffective just-in-time training and procedure inadequacies were also factors that degraded all the crews' ability to operate the plant.</p>
Degree of degradation of failed or unavailable component(s).	N/A	
Period of time (exposure time) affect on the performance deficiency.	Yes	<p>With respect to this specific event, Reactor Coolant System cold leg temperature began lowering at 11:26:44 on 2/12/2011. The first VHT setpoint reset occurred at 11:27:56. Reactor power stabilized at 96% at 11:29:32. The entire event lasted approximately 3 minutes.</p> <p>With respect to the latent issues underlying this performance deficiency, the exposure time is indeterminate, but clearly developed over an extended period. The procedural and training performance weaknesses specified above existed for many years.</p> <p>The Dominion root cause evaluation team determined that the causal factors for the event had existed for a</p>

IMC 0609, APPENDIX M, TABLE 4.1

Decision Attribute	Applicable to Decision?	Basis for Input to Decision – Provide qualitative and/or quantitative information for management review and decision making.
		considerable period of time. However, they did not quantify the exposure time.
The likelihood that the licensee's recovery actions would successfully mitigate the performance deficiency.	Yes	<p>The licensee's root cause analysis was thorough and appeared to identify all underlying causal factors. The associated proposed corrective actions appear to adequately address the underlying causal factors.</p> <p>During the recent April 2011 Unit 2 refueling outage, there were no significant configuration control issues, and no NRC or self-revealing findings or violations. Resident inspectors have observed improved procedure adherence and an improvement in human performance since the Special Inspection in February 2011.</p>
Additional qualitative circumstances associated with the finding that regional management should consider in the evaluation process.	Yes	<p>During this event, <u>all</u> control room operators on the crew failed to either recognize or respond properly to the unintended power transient. <u>None</u> of the operators initially identified the breakdowns in command and control or the deviations from defined roles and responsibilities as worthy of note in the immediate post-event brief or in discussions regarding whether it was appropriate to continue with the turbine testing (other than to identify that the event was initiated by the turbine operator's action to press the increase, rather than the decrease pushbutton).</p> <p>Dominion was initially slow to recognize the scope and the significance of the event. Despite involvement of multiple layers of licensee management personnel during and immediately following the event, numerous performance problems during the event were not fully recognized until the next day after the event. The inadvertent power rise was initially assessed as 4%, vice the actual 8% because the operators used neutron flux instead of Q-power as the indicator of power increase. Actions taken to withdraw reactor control rods, reset VHT setpoints, and open the turbine bypass valve were not identified as inappropriate until a reactor engineering review of plant computer data many hours after the event. NRC inspector challenges of licensee management decisions relating to the event preceded</p>

IMC 0609, APPENDIX M, TABLE 4.1

Decision Attribute	Applicable to Decision?	Basis for Input to Decision – Provide qualitative and/or quantitative information for management review and decision making.
		<p>Dominion's disqualification of some of the operating crew members. NRC questions led to recognition by licensee that multiple concurrent positive reactivity additions were not adequately addressed by station procedures. NRC challenged the licensee's limited initial use of the condition reporting and procedure change process in response to this event.</p> <p>Following the event, licensee operations management issued a Standing Order to address when acceptable to reset the VHT setpoints. However, Dominion delayed making any related changes to permanent plant procedures.</p> <p>Dominion provided training on recent significant industry reactivity control events. This training was conducted in the training cycle immediately preceding the February 2011 power transient event and was administered to all Millstone station supervisors, including the supervision of Operations Crew D. The human performance errors exhibited during the event indicate this training was not effective.</p>



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

June 14, 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 NO. 2 – REQUEST FOR ADDITIONAL  
INFORMATION REGARDING RELIEF REQUEST FOR IMPLEMENTATION OF  
A RISK-INFORMED INSERVICE INSPECTION PROGRAM (TAC NO. ME5962)

Dear Mr. Heacock:

By letter dated March 30, 2011 (Agencywide Document Access and Management System (ADAMS) Accession No. ML110900670), Dominion Nuclear Connecticut, Inc. submitted Relief Request RR-04-11 for Millstone Power Station, Unit No. 2 (MPS2). Relief Request RR-04-11 proposes to implement a risk-informed/safety-based inservice inspection (ISI) program for MPS2 during the entire fourth 10-year ISI interval. In order to complete its review, the Nuclear Regulatory Commission staff requests a response to the enclosed question.

The draft question was sent to Ms. Wanda Craft, of your staff, to ensure that the question was understandable, the regulatory basis for the question was clear, and to determine if the information was previously docketed. On June 7, 2011, Ms. Craft agreed that you would provide a response by July 8, 2011.

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

Sincerely,

A handwritten signature in black ink, appearing to read "Carleen J. Sanders".

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

IMPLEMENTATION OF A RISK-INFORMED INSERVICE INSPECTION

PROGRAM FOR THE FOURTH 10-YEAR INSPECTION INTERVAL

MILLSTONE POWER STATION, UNIT NO. 2

DOCKET NUMBER: 50-336

By letter dated March 30, 2011 (Agencywide Document Access and Management System (ADAMS) Accession No. ML110900670), Dominion Nuclear Connecticut, Inc. (the licensee), submitted Relief Request RR-04-11 for Millstone Power Station, Unit No. 2 (MPS2). Relief Request RR-04-11 proposes to implement a risk-informed/safety-based inservice inspection (ISI) program for MPS2 during the entire fourth 10-year ISI interval. The 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.

RAI -01: Attachment 1, Table 1.1, "PRA [probabilistic risk assessment] Quality Gap Analysis: MPS2," of the licensee's March 30, 2011, submittal indicates that multi-unit flood areas and scenarios were not modeled for the MPS2 internal flooding PRA (item IFPP-A3). Please provide an explanation for why multi-unit flood areas and scenarios are not relevant for MPS2, and discuss implications to the ISI program risk assessment for any shared systems not modeled in the flooding PRA.

Enclosure

June 14, 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 NO. 2 – REQUEST FOR ADDITIONAL INFORMATION REGARDING RELIEF REQUEST FOR IMPLEMENTATION OF A RISK-INFORMED INSERVICE INSPECTION PROGRAM (TAC NO. ME5962)

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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:  
As stated

cc w/encl: Distribution via Listserv

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ADAMS Accession No.: **ML111590890**      \*Memo dated

OFFICE	LPL1-2/PM	LPL1-2/LA	DRA/APLA/BC	LPL1-2/BC
NAME	CSanders	ABaxter	DHarrison	HChernoff
DATE	6/13/11	6/13/11	05/10/2011*	6/14/11

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

June 15, 2011

MN No. 11-024

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I  
NOTICE OF LICENSEE MEETING

Licensee: Dominion Nuclear Connecticut, Inc.

Facility: Millstone Power Station Unit 2

Docket No.: 50-336

EA No.: 11-047

Date/Time: June 30, 2011  
1:00 p.m. to 3:00 p.m.

Location: NRC Region I Office, Public Meeting Room  
475 Allendale Road  
King of Prussia, PA 19406

Purpose: Dominion Nuclear Connecticut requested a Regulatory Conference with the NRC to discuss a preliminary White finding that was identified during a special inspection at Millstone Station, Unit 2, completed in April 2011. The finding involved apparent violations of NRC requirements associated with failure of Millstone personnel to carry out their assigned roles and responsibilities and inadequate reactivity management during main turbine control valve testing on February 12, 2011. The conference will include a discussion of the significance determination for the finding and whether enforcement action is warranted.

Category: This is a Category 1 Meeting. The public is invited to observe this meeting and will have opportunities to communicate with the NRC after the business portion of the meeting but before the meeting is adjourned.

Attendees:  
NRC: W. Dean, Regional Administrator, Region I  
C. Miller, Director, Division of Reactor Safety, Region I  
D. Roberts, Director, Division of Reactor Projects, Region I  
D. Jackson, Chief, Projects Branch 5, Region I  
S. Hansell, Chief, Operations Branch, Region I  
W. Cook, Senior Reactor Analyst, Region I  
D. Holody, Team Leader, Enforcement, Region I

Licensee: A. J. Jordan, Site Vice President  
R. MacManus, Director Nuclear Station Safety and Licensing  
K. Grover, Operations Manager  
L. Armstrong, Training Manager  
B. Willkens, Nuclear Specialist  
W. Bartron, Station Licensing Supervisor

Meeting Contacts: Samuel L. Hansell, Jr., Chief, Operations Branch  
(610) 337-5046  
E-mail: [samuel.hansell@nrc.gov](mailto:samuel.hansell@nrc.gov)

Marjorie M. McLaughlin, Senior Enforcement Specialist  
(610) 337-5240  
E-mail: [marjorie.mclaughlin@nrc.gov](mailto:marjorie.mclaughlin@nrc.gov)


This meeting notice with the enclosed agenda can be located in the Agencywide Documents Access and Management System (ADAMS) with Accession Number ML111650357. Inspection Report 05000336/2011008, which discusses the issues associated with this finding, can be located in ADAMS with Accession Number ML111470484. ADAMS is accessible from the NRC Web Site at: <http://www.nrc.gov/reading-rm/adams.html>.

The NRC's Policy Statement, "Enhancing Public Participation in NRC Meetings," effective May 28, 2002, applies to this meeting. The policy statement can 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 one of the NRC's meeting contacts. 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 an NRC meeting contact no later than two business days prior to the meeting.

Interested members of the public can participate in this meeting via toll-free teleconference. For details please contact one of the NRC's meeting contacts. Attendance by NRC personnel at this meeting should be made known by June 27, 2011, via telephone to an NRC's meeting contact.

Approved By:

  
Samuel L. Hansell, Jr., Chief  
Operations Branch  
Division of Reactor Safety

cc w/encl: Distribution via ListServ

Distribution w/encl: (via email)

Deputy Executive Director for Reactor Programs, OEDO  
 Director, Office of Nuclear Reactor Regulation, NRR  
 Deputy Director, Office of Nuclear Reactor Regulation (NRR/ADPR)  
 Director, Division of Licensing Project Management  
 Project Directorate I-1 (PD1/2), NRR  
 Project Manager, NRR  
 W. Dean, RA  
 D. Lew, DRA  
 D. Roberts, DRP  
 J. Clifford, DRP  
 C. Miller, DRS  
 P. Wilson, DRS  
 S. Bush-Goddard, RI OEDO  
 D. Screnci, ORA  
 N. Sheehan, ORA  
 K. Farrar, ORA  
 N. McNamara, ORA  
 R. Barkley, ORA  
 D. Jackson, DRP  
 T. Setzer, DRP  
 D. Dodson, DRP  
 S. Shaffer, DRP, SRI  
 B. Haagensen, RI  
 J. Krafty, DRP, RI  
 C. Kowalyshyn, OA  
 C. O'Daniell, ORA  
 D. Bearde, DRS  
 RidsNRRPM Millstone Resource  
 RidsNRRDorlLpl1-2 Resource  
 ROPreportsResource  
 PMNS

SUNSI Review Complete: JC (Reviewer's Initials)

ADAMS PACKAGE NO.: ML111650467

ADAMS ACCESSION NO.: ML111650357

DOCUMENT NAME: G:\DRS\OPERATIONS BRANCH\CARUSO\MILLSTONE REG CONF.DOC

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NAME	PPresby/PP	SHansell/JC	DHolody/MMM	DJacksonDJ w/edits
DATE	06/14/11	6/15/11	06/15/11	6/14/11

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Enclosure

# **Agenda**

## **NRC Regulatory Conference**

### **Millstone**

June 30, 2011

Introductions	NRC (5 minutes)
Discussion of Regulatory Process	NRC (5 minutes)
Finding Details and Significance Determination	NRC (15 minutes)
Dominion Provides Additional Information	Dominion (30 minutes)
NRC Questions and Dialogue	Dominion (55 minutes)
Closing Remarks	NRC (10 minutes)

Enclosure

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I  
NOTICE OF LICENSEE MEETING  
**\*\*\*Rescheduled\*\*\***

June 24, 2011

Licensee: Dominion Nuclear Connecticut, Inc.

Facility: Millstone Power Station Unit 2

Docket No.: 50-336

EA No.: 11-047

Date/Time: **July 19, 2011**  
**1:00 p.m. to 3:00 p.m.**

Location: NRC Region I Office, Public Meeting Room  
475 Allendale Road  
King of Prussia, PA 19406

Purpose: Dominion Nuclear Connecticut requested a Regulatory Conference with the NRC to discuss a preliminary White finding that was identified during a special inspection at Millstone Station, Unit 2, completed in April 2011. The finding involved apparent violations of NRC requirements associated with failure of Millstone personnel to carry out their assigned roles and responsibilities and inadequate reactivity management during main turbine control valve testing on February 12, 2011. The conference will include a discussion of the significance determination for the finding and whether enforcement action is warranted.

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D. Roberts, Director, Division of Reactor Projects, Region I  
S. Hansell, Chief, Operations Branch, Region I  
W. Cook, Senior Reactor Analyst, Region I  
D. Holody, Team Leader, Enforcement, Region I

Licensee: A. J. Jordan, Site Vice President  
R. MacManus, Director Nuclear Station Safety and Licensing  
F. Grover, Operations Manager  
L. Armstrong, Training Manager  
B. Willkens, Nuclear Specialist  
W. Bartron, Station Licensing Supervisor

Meeting Contacts: Samuel L. Hansell, Jr., Chief, Operations Branch  
(610) 337-5046  
E-mail: [samuel.hansell@nrc.gov](mailto:samuel.hansell@nrc.gov)

Marjorie M. McLaughlin, Senior Enforcement Specialist  
(610) 337-5240  
E-mail: [marjorie.mclaughlin@nrc.gov](mailto:marjorie.mclaughlin@nrc.gov)

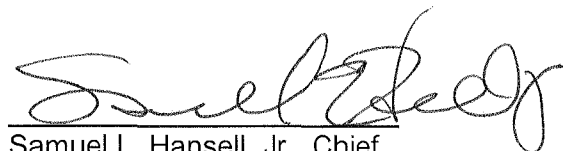
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Interested members of the public can participate in this meeting via toll-free teleconference. For details please contact the NRC's meeting contact. Attendance by NRC personnel at this meeting should be made known by July 17, 2011, via telephone to the NRC's meeting contact.

Approved By:



Samuel L. Hansell, Jr., Chief  
Operations Branch  
Division of Reactor Safety

cc w/encl: Distribution via ListServ

Distribution w/encl: (via email)

- Deputy Executive Director for Reactor Programs, OEDO
- Director, Office of Nuclear Reactor Regulation, NRR
- Deputy Director, Office of Nuclear Reactor Regulation (NRR/ADPR)
- Director, Division of Licensing Project Management
- Project Directorate I-1 (PD1/2), NRR
- Project Manager, NRR
- W. Dean, RA
- D. Lew, DRA
- D. Roberts, DRP
- J. Clifford, DRP
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- P. Wilson, DRS
- S. Bush-Goddard, RI OEDO
- D. Screnci, ORA
- N. Sheehan, ORA
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- N. McNamara, ORA
- R. Barkley, ORA
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- D. Dodson, DRP
- S. Shaffer, DRP, SRI
- B. Haagensen, RI
- J. Krafty, DRP, RI
- C. Kowalyshyn, OA
- C. O'Daniell, ORA
- D. Bearde, DRS
- RidsNRRPM Millstone Resource
- RidsNRRDorLpl1-2 Resource
- ROPreportsResource
- PMNS

SUNSI Review Complete: slh\* (Reviewer's Initials)

ADAMS PACKAGE NO.: ML111650467 Meeting Notice ADAMS ACCESSION NO.: ML111650357

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NAME	PPresby/slh* for	SHansell/slh	DHolody/mmm for	DJackson/dej*
DATE	06/24/2011	06/24/2011	06/24/2011	06/24/2011

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Enclosure

# Agenda

## NRC Regulatory Conference

### Millstone

July 19, 2011

Introductions	NRC (5 minutes)
Discussion of Regulatory Process	NRC (5 minutes)
Finding Details and Significance Determination	NRC (15 minutes)
Dominion Provides Additional Information	Dominion (30 minutes)
NRC Questions and Dialogue	Dominion (55 minutes)
Closing Remarks	NRC (10 minutes)

Enclosure



U.S. NUCLEAR REGULATORY COMMISSION  
REGION I  
NOTICE OF LICENSEE MEETING  
**\*\*\*Rescheduled\*\*\***

June 24, 2011

Licensee: Dominion Nuclear Connecticut, Inc.

Facility: Millstone Power Station Unit 2

Docket No.: 50-336

EA No.: 11-047

Date/Time: **July 19, 2011**  
**1:00 p.m. to 3:00 p.m.**

Location: NRC Region I Office, Public Meeting Room  
475 Allendale Road  
King of Prussia, PA 19406

Purpose: Dominion Nuclear Connecticut requested a Regulatory Conference with the NRC to discuss a preliminary White finding that was identified during a special inspection at Millstone Station, Unit 2, completed in April 2011. The finding involved apparent violations of NRC requirements associated with failure of Millstone personnel to carry out their assigned roles and responsibilities and inadequate reactivity management during main turbine control valve testing on February 12, 2011. The conference will include a discussion of the significance determination for the finding and whether enforcement action is warranted.

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D. Holody, Team Leader, Enforcement, Region I

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R. MacManus, Director Nuclear Station Safety and Licensing  
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W. Bartron, Station Licensing Supervisor

Meeting Contacts: Samuel L. Hansell, Jr., Chief, Operations Branch  
(610) 337-5046  
E-mail: [samuel.hansell@nrc.gov](mailto:samuel.hansell@nrc.gov)

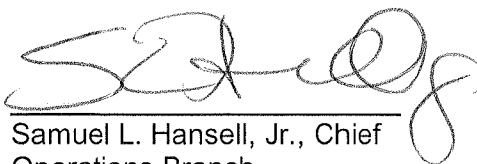
Marjorie M. McLaughlin, Senior Enforcement Specialist  
(610) 337-5240  
E-mail: [marjorie.mclaughlin@nrc.gov](mailto:marjorie.mclaughlin@nrc.gov)

This meeting notice with the enclosed agenda can be located in Agencywide Documents Access and Management System (ADAMS) with Accession Number ML111751727. Inspection Report 05000336/2011008, which discuss the issues associated with this finding, can be located in ADAMS with Accession Number ML111470484. ADAMS is accessible from the NRC Web Site at: <http://www.nrc.gov/reading-rm/adams.html>.

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Approved By:   
Samuel L. Hansell, Jr., Chief  
Operations Branch  
Division of Reactor Safety

cc w/encl: Distribution via ListServ

Distribution w/encl: (via email)

- Deputy Executive Director for Reactor Programs, OEDO
- Director, Office of Nuclear Reactor Regulation, NRR
- Deputy Director, Office of Nuclear Reactor Regulation (NRR/ADPR)
- Director, Division of Licensing Project Management
- Project Directorate I-1 (PD1/2), NRR
- Project Manager, NRR
- W. Dean, RA
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- D. Bearde, DRS
- RidsNRRPMP Millstone Resource
- RidsNRRDorlPl1-2 Resource
- ROPreportsResource
- PMNS

SUNSI Review Complete: slh\* (Reviewer's Initials)

ADAMS PACKAGE NO.: ML111650467 Original Meeting Notice ADAMS ACCESSION NO.: ML111650357  
 Updated Meeting Notice ADAMS ACCESSION NO.: ML111751727

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OFFICE	RI/DRS	RI/DRS	RI/ORA	RI/DRP
NAME	PPresby/slh* for	SHansell/slh	DHolody/mmm for	DJackson/dej*
DATE	06/24/2011	06/24/2011	06/24/2011	06/24/2011



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

August 3, 2011

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  
05000336/2011003 AND 05000423/2011003

Dear Mr. Heacock:

On June 30, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Millstone Power Station Unit 2 and Unit 3. The enclosed inspection report documents the inspection results, which were discussed on August 1, 2011, with Mr. A. J. Jordan 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 two NRC-identified findings and two self-revealing findings of very low safety significance (Green). Three of these 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 (CAP), the NRC is treating these findings as non-cited violations (NCVs) consistent with Section 2.3.2.a 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.

D. Heacock

2

In accordance with Title 10 of the Code of Federal Regulations (CFR) Part 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 Web Site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

A handwritten signature in black ink, appearing to read "Donald E. Jackson". The signature is fluid and cursive, with a large initial "D" and "J".

Donald E. Jackson, Chief  
Projects Branch 5  
Division of Reactor Projects

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

Enclosure: Inspection Report No. 05000336/2011003 and 05000423/2011003  
w/ Attachment: Supplemental Information

cc w/encl: Distribution via Listserv

D. Heacock

In accordance with Title 10 of the Code of Federal Regulations (CFR) Part 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 Web Site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Donald E. Jackson, Chief  
Projects Branch 5  
Division of Reactor Projects

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

Enclosure: Inspection Report No. 05000336/2011003 and 05000423/2011003  
w/ Attachment: Supplemental Information

Distribution w/encl:

W. Dean, RA  
D. Lew, DRA  
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C. Kowalyshyn, DRP, OA  
RidsNRRPM Millstone Resource  
RidsNRRDorLp1-2 Resource  
ROPreports@NRC.gov

**SUNSI Review Complete: TCS (Reviewer's Initials)**

DOCUMENT NAME:G:\DRP\BRANCH5\Reports\Final\MillstoneIR1103.docx

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ML112160449

OFFICE	RI/DRP	RI/DRP	RI/DRP
NAME	SShaffer/TSC for via email	TSetzer/TCS	DJackson/DJ
DATE	8/3/11	8/3/11	8/3/11

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## U.S. NUCLEAR REGULATORY COMMISSION

## REGION I

Docket No.: 50-336, 50-423

License No.: DPR-65, NPF-49

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Licensee: Dominion Nuclear Connecticut, Inc.

Facility: Millstone Power Station, Units 2 and 3

Location: P. O. Box 128  
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## SUMMARY OF FINDINGS

IR 05000336/2011003, 05000423/2011003; 04/01/2011 - 06/30/2011; Millstone Power Station Unit 2 and Unit 3; Operability Evaluations, Surveillance Testing, Event Follow-up.

The report covered a three-month period of inspection by resident and region-based inspectors. Four Green findings, three of which were non-cited violations (NCV), were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process." The cross-cutting aspects were determined using IMC 0310, "Components Within the Cross Cutting Areas." Findings for which the significance determination process (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: Initiating Events**

Green. A self-revealing finding (FIN) of very low safety significance (Green) was identified for Dominion's failure to follow procedure OP 2204, "Load Changes," when starting the 'A' steam generator feedpump (SGFP). Specifically, the operating crew failed to maintain adequate SGFP suction pressure (greater than 325 psig) while starting the 'A' SGFP, which led to a trip of the 'B' SGFP and subsequent reactor trip on low steam generator level. Dominion entered this issue into their corrective action program (CR431574); conducted training exercises emphasizing safe operating envelopes, critical parameters to monitor, and actions to take to restore margin if plant conditions degrade; and has revised procedure OP 2204.

The finding is more than minor because it is similar to NRC Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," Example 4b; in that, a failure to follow procedure led to a reactor trip. This issue is associated with the Human Performance attribute of the Initiating Events cornerstone and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the failure of the operators to properly monitor SGFP suction pressure led to a loss of adequate feedwater flow and a reactor trip. The inspectors conducted a Phase 1 screening in accordance with NRC Inspection Manual Chapter (IMC) Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," and determined that the finding was of very low safety significance (Green) because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available.

The inspectors determined that this finding had a cross-cutting aspect in the Human Performance cross-cutting area, Work Practices component, because Dominion personnel did not properly follow the load changes procedure. [H.4(b)] (Section 40A3)

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## Cornerstone: Mitigating Systems

Green. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for Dominion's failure to take timely corrective actions for a condition adverse to quality involving the degradation and subsequent through-wall leakage of Unit 3 service water valves 3SWP\*V699 (3HVQ\*ACUS1B Bypass Valve), 3SWP\*V018 (3HVQ\*ACUS2B Unit Cooler Inlet Valve), and 3SWP\*V696 (3HVQ\*ACUS2B Unit Cooler Outlet Valve). Specifically, Dominion did not adequately implement a schedule for prioritizing and completing corrective actions on affected aluminum bronze components, which were known to be susceptible to de-alloying, commensurate with the safety significance of the degraded condition. As a result, through-wall leaks developed on these valves and resulted in unplanned loss of operability and additional unavailability of the safety-related support systems for the 'B' train of containment recirculation spray pumps. Dominion took immediate corrective action to replace the three leaking service water (SW) valves (CR428785).

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, the degraded condition caused a loss of operability of the 'B' train of the containment recirculation spray system. 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 of systems that respond to initiating events to prevent undesirable consequences. 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 it was not a design or qualification deficiency, did not represent an actual loss of system safety function of a single train for greater than its Technical Specification allowed outage time, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

The finding had a cross-cutting aspect in the Problem Identification and Resolution cross-cutting area, Corrective Action Program component, because Dominion did not ensure that issues potentially impacting nuclear safety were corrected in a timely manner commensurate with their safety significance. Specifically, Dominion failed to adequately implement corrective actions to address a known de-alloying issue with SW valves before the condition led to the unplanned loss of operability and additional unavailability of the safety-related support systems for the 'B' train of containment recirculation spray pumps [P.1(d)]. (Section 1R15)

- Green. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for Dominion's failure to take timely corrective action to address repetitive out of calibration conditions associated with safety-related 120 VAC Unit 2 inverters. To date, Dominion has taken corrective action to adjust the over-frequency and under-frequency transfer limits (CR426589).

The inspectors determined the finding was more than minor because it is similar to the more than minor Example '4f' of NRC Inspection Manual Chapter (IMC) 0612, Appendix E, "Examples of Minor Issues." Additionally, the issue is more than minor because the

performance deficiency can be reasonably viewed as a precursor to a significant event; in that, the history of over- and under-frequency limits drifting out of tolerance could lead to the unavailability of safety-related equipment powered from the inverters. The inspectors conducted a Phase 1 screening in accordance with NRC IMC Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," and determined that the finding was of very low safety significance (Green) because it was not a design or qualification deficiency, did not represent a loss of system safety function, did not represent an actual loss of safety function of a single train, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

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 take appropriate corrective action in a timely manner to address the repetitive out of calibration conditions with the 120 VAC safety related inverters. [P.1(d)] (Section 1R22)

### **Cornerstone: Barrier Integrity**

- Green. A self-revealing Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," was identified for Dominion's failure to take prompt corrective action to address the cause of main steam safety valve (MSSV) exhaust pipe bushings not seating, which resulted in a loss of the Enclosure Building's safety function to control the release of radioactive material. Dominion took corrective action to clean and lubricate the MSSV exhaust pipe and also implemented a modification to upgrade the MSSV outlet boot and qualify it as part of the Enclosure Building filtration boundary (CR420485).

The finding was more than minor because it was associated with the Procedure Quality attribute of the Barrier Integrity cornerstone and affected the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, the failure of the MSSV sliding bushings to seat properly caused the Enclosure Building Filtration System (EBFS) to fail its surveillance test, and its safety function to control the release of radioactive material could not be assured. The inspectors conducted a Phase 1 screening in accordance with NRC Inspection Manual Chapter (IMC) Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," and determined that the finding was of very low safety significance (Green) because it only represents a degradation of the radiological barrier function provided for the auxiliary building.

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 take appropriate corrective action to address the Enclosure Building surveillance test failure in 2009. [P.1(d)] (Section 4OA3)

## REPORT DETAILS

Summary of Plant Status

Millstone Units 2 and 3 began the inspection period operating at 100 percent power. On April 2, 2011, Unit 2 was shutdown to begin refueling outage 2R20. Unit 2 returned to 100 percent power on May 4, 2011. On June 20, 2011, Unit 2 reduced power to 30 percent to repair an oil leak on the 'C' reactor coolant pump (RCP) motor. Following repairs, Unit 2 increased power to approximately 59 percent power when the plant tripped on low steam generator water level. Unit 2 returned to 100 percent power on June 23, 2011. Unit 3 remained at or near 100 percent power for the entire inspection period.

## 1. REACTOR SAFETY

**Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**1R01 Adverse Weather Protection (71111.01 - 3 samples).1 External Flooding Inspectiona. Inspection Scope

The inspectors evaluated Dominion's readiness to cope with external flooding at Unit 2 and Unit 3. The inspectors reviewed the Unit 2 and Unit 3 Updated Final Safety Analysis Report (UFSAR) and identified areas that could be affected by external flooding due to a design basis flood. The inspectors reviewed applicable procedures to verify that the actions required in the event of flooding could reasonably be completed, and that the appropriate equipment was pre-staged. The inspectors performed walkdowns of the Unit 2 and Unit 3 intake structures, fire pump houses, and inspected the material condition of flood doors in order to determine if the structures and components were being adequately maintained. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings were identified.

.2 Grid Stability - Readiness of Offsite and Alternate AC Power Systemsa. Inspection Scope

The inspectors reviewed Dominion's Independent System Operator (ISO) New England and Connecticut Valley Electric Exchange (CONVEX) procedures for notifications of abnormal grid conditions to determine if they were adequate to ensure the reliability of alternating current (AC) power systems. The inspectors reviewed Dominion's procedures to determine if they addressed inadequate post-trip voltages of the offsite power supply, unknown post trip voltages, reassessment of risk when maintenance activities could affect grid reliability, and required communication between Dominion and

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ISO New England/CONVEX when changes at the site could impact the transmission system. The inspectors interviewed selected shift managers to determine if they were familiar with the procedures for abnormal grid conditions. The inspectors performed a walkdown of the switchyard, main transformers, normal station service transformers, and reserve station service transformers; and performed a review of the system health reports for the switchyard and transformers in order to determine the material condition of the offsite power sources.

b. Findings

No findings were identified.

.3 Seasonal Site Inspection

a. Inspection Scope

The inspectors performed a review of Dominion's readiness for hurricane season. The inspectors reviewed selected equipment, instrumentation, and supporting structures to determine if they were configured in accordance with Dominion's procedures, and that adequate controls were in place to ensure functionality of the systems. The inspectors reviewed the Unit 2 and Unit 3 UFSAR and Technical Specifications (TS) and compared the analysis with procedure requirements to ascertain that procedures were consistent with the UFSAR. The inspectors performed partial walkdowns of the Unit 2 and Unit 3 intake structures, fire pump houses, flood doors, and flood protection equipment to determine the material condition of installed flood protection equipment, and verify that the portable flood protection equipment was properly staged. The inspectors also reviewed previous CRs and work orders to verify that the deficiencies identified have been corrected. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04 - 3 samples)

.1 Partial System Walkdowns

a. Inspection Scope

The inspectors performed three partial system walkdowns during this inspection period. The inspectors reviewed the documents listed in the Attachment to determine the correct system alignment. The inspectors performed a walkdown of each system to determine if the critical portions of the selected systems were correctly aligned, in accordance with the procedures, and to identify any discrepancies that may have had an effect on operability. The walkdowns included selected switch and valve position checks, and verification of electrical power to critical components. Finally, the inspectors evaluated other elements, such as material condition, housekeeping, and component labeling. The

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following systems were reviewed based on their risk significance for the given plant configuration:

### Unit 2

- Spent Fuel Cooling with the 'A' Low Pressure Safety Injection (LPSI) pump and 'A' Shutdown cooling (SDC) heat exchanger with the core off-loaded in the spent fuel pool on April 13, 2011;
- 'B' High Pressure Safety Injection (HPSI) train while the 'A' train was out of service (OOS) for testing on May 12, 2011; and

### Unit 3

- 'A' system HPSI with the 'B' train out for testing on May 5, 2011.

#### b. Findings

No findings were identified.

#### .2 Complete System Walkdown (71111.04S – 1 sample)

##### a. Inspection Scope

The inspectors completed a detailed review of the alignment and condition of Unit 2 EBFS. The inspectors performed a walkdown of the system to determine whether critical portions, such as circuit breakers and switches, were aligned in accordance with procedures and to identify any discrepancies that may have had an adverse effect on operability. The inspectors also reviewed the system health reports, condition reports, and Maintenance Rule evaluations to determine whether equipment problems were being identified and appropriately resolved. Documents reviewed during the inspection are listed in the Attachment.

##### b. Findings

No findings were identified.

1R05 Fire Protection (71111.05Q – 5 samples).1 Fire Protection Toursa. Inspection Scope

The inspectors performed walkdowns of five fire protection areas. The inspectors reviewed Dominion's fire protection program to determine the required fire protection design features, fire area boundaries, and combustible loading requirements for the selected areas. The inspectors walked down these areas to assess Dominion's control of transient combustible material and ignition sources. In addition, the inspectors evaluated the material condition and operational status of fire detection and suppression capabilities, fire barriers, and any related compensatory measures. The inspectors compared the existing conditions of the areas to the fire protection program requirements to determine if all program requirements were being met. Documents reviewed during the inspection are listed in the Attachment. The fire protection areas reviewed included:

Unit 2

- Containment Building, Fire Area C-1;
- West DC Switchgear Room, Fire Area A-21;
- West Battery Room, Fire Area A-23;
- Auxiliary Building, -5' General Area, Fire Area A-1; and

Unit 3

- East Motor Control Center (MCC) and Rod Control Area, Fire Area AB-5.

b. Findings

No findings were identified.

.2 Annual Fire Drill Observation (71111.05A – 1 sample)a. Inspection Scope

To evaluate the readiness of station personnel to fight fires, the inspectors observed Dominion personnel performance during a fire brigade drill on May 13, 2011. The drill simulated a fire in the Unit 2 East Cable Vault in the turbine building. The inspectors observed the fire brigade members using protective clothing, turnout gear, self-contained breathing apparatus and entering the fire area. The inspectors also observed the fire fighting equipment brought to the fire scene to evaluate whether sufficient equipment was available to effectively control and extinguish the simulated fire. The inspectors evaluated whether the permanent plant fire hose lines were capable of reaching the fire area and whether hose usage was adequately simulated. The inspectors observed the fire fighting directions and communications between fire brigade members. The inspectors also evaluated whether the pre-planned drill scenario was followed and

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observed the post drill critique to evaluate if the drill objectives were satisfied and that any drill weaknesses were discussed. The inspectors evaluated fire brigade performance, including the readiness of the fire brigade to fight fires and the utilization of preplanned strategies.

b. Findings

No findings were identified.

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

a. Inspection Scope

In-Service Inspection Program

The inspectors reviewed a sample of nondestructive examination activities and discussed the results of the examination with the Dominion corporate Level III In-Service Inspection Inspector. There were no volumetric or surface examinations from the previous outage with relevant indications that were analytically evaluated and accepted by Dominion for continued service.

Vessel Head Inspection

No vessel head activities were performed during this outage.

Welding and Repair Program

The inspectors reviewed a complete welding and fabrication package consisting of a revised piping anchor to determine if the welding activities were performed in accordance with American Society of Mechanical Engineers (ASME) Code requirements, or an NRC approved alternative.

Boric Acid Control Program

The inspectors reviewed the boric acid control program with the Dominion engineering lead. The inspectors reviewed the photographic evidence of boric acid leaks with the Dominion engineering lead and discussed various engineering evaluations performed for boric acid found on Reactor Coolant System (RCS) piping and components. Also, the inspectors verified that degraded or non-conforming conditions are identified properly in Dominion's corrective action program.

Steam Generator (SG) Program

No in-situ pressure testing was performed during this inspection. The inspectors compared the estimated size and number of tube flaws detected during the current outage against the previous outage operational assessment predictions to assess Dominion's prediction capability. The inspectors confirmed that the SG tube eddy current examination scope and expansion criteria meet TS requirements, Electric Power

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Research Institute Guidelines, and commitments made to the NRC. The inspectors confirmed all areas of potential degradation (based on site-specific experience and industry experience) are being inspected, especially areas which are known to represent potential eddy current challenges. The inspectors confirmed that the eddy current probes and equipment are qualified for the expected types of tube degradation and assessed the site specific qualification of one or more techniques.

Because Dominion identified loose parts or foreign material on the secondary side of the SG, the inspectors evaluated Dominion's corrective actions. The inspectors confirmed that Dominion has taken/planned appropriate repairs of affected SG tubes, and inspected the secondary side of the SG to remove foreign objects. If the foreign objects are inaccessible, the inspectors determined whether Dominion has performed an evaluation of the potential effects of object migration and/or tube fretting damage. The inspectors reviewed a random sample of eddy current data in this regard.

b. Findings

No findings were identified

1R11 Licensed Operator Requalification Program (71111.11 - 3 samples)

Resident Inspector Quarterly Review (71111.11Q)

a. Inspection Scope

The inspectors observed simulator-based licensed operator requalification training for Unit 2 on May 24, 2011, and June 7, 2011, and for Unit 3 on June 7, 2011. The inspectors evaluated crew performance in the areas of clarity and formality of communications; ability to take timely actions; prioritization, interpretation, and verification of alarms; procedure use; control board manipulations; oversight and direction from supervisors; and command and control. Crew performance in these areas was compared to Dominion management expectations and guidelines as presented in OP-MP-100-1000, "Millstone Operations Guidance and Reference Document." The inspectors compared simulator configurations with actual control board configurations. The inspectors also observed Dominion evaluators discuss identified weaknesses with the crew and/or individual crew members, as appropriate. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 1 sample)a. Inspection Scope

The inspectors performed one maintenance effectiveness inspection sample of Dominion's evaluation of degraded conditions for the Unit 2 Charging and Letdown system. The inspectors reviewed Dominion's implementation of the "Maintenance Rule," 10 CFR 50.65. The inspectors reviewed Dominion's ability to identify and address common cause failures; the applicable maintenance rule scoping document for each system; the current classification of these systems in accordance with 10 CFR 50.65 paragraph (a)(1) or (a)(2); and the adequacy of the performance criteria and goals established for each system, as appropriate. The inspectors also reviewed recent system health reports, Condition Reports (CR), apparent cause determinations, functional failure determinations, and discussed system performance with the responsible system engineer. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 9 samples)a. Inspection Scope

The inspectors evaluated online risk management for emergent and planned activities. The inspectors reviewed maintenance risk evaluations, work schedules, and control room logs to determine if concurrent planned and emergent maintenance or surveillance activities adversely affected the plant risk already incurred with out-of service (OOS) components. The inspectors evaluated whether Dominion took the necessary steps to control work activities, minimize the probability of initiating events, and maintain the functional capability of mitigating systems. The inspectors assessed Dominion's risk management actions during plant walkdowns. Documents reviewed during the inspection are listed in the Attachment. The inspectors reviewed the conduct and adequacy of risk assessments for the following maintenance and testing activities:

Unit 2

- 2R20 Shutdown Risk Assessment on March 31, 2011;
- Orange Risk for RCS Drain down to Mid-Loop on April 5, 2011;
- Orange Risk for North Bus Outage on April 5, 2011;
- Orange Risk for Replacement of 2 SW-97B (only one train of SW available) on April 7, 2011;
- Risk Mitigation Plan for Isophase Bus Duct Seal Bushing Installation on April 19, 2011;
- Alternate Plant Configuration for Isolating the 'A' Pressurizer Spray Line;
- Yellow Risk for 'A' SW pump OOS and ECCS suction valve testing on May 24, 2011;

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Unit 3

- Emergent risk assessment for a failure of the SI logic module in the SSPS train 'B' while switchyard work was in progress on April 18, 2011; and
- Emergent work to replace SW valves 3SWP\*V699, 3SWP\*V018 and 3SWP\*V696 due to de-alloying.

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15 – 7 samples)a. Inspection Scope

The inspectors reviewed seven operability determinations (OD). The inspectors evaluated the ODs against the guidance contained in NRC Regulatory Issue Summary 2005-20, Revision to Guidance Formerly Contained in NRC Generic Letter 91-18, "Information to Licensees Regarding Two NRC Inspection Manual Sections on Resolution of Degraded and Nonconforming Conditions and on Operability." The inspectors also discussed the conditions with operators, and system and design engineers, as necessary. Documents reviewed during the inspection are listed in the Attachment. The inspectors reviewed the adequacy of the following evaluations of degraded or non-conforming conditions:

Unit 2

- Engineering Technical Evaluation, ETE-MP-2011-0030, addressing a small breach in the control room envelope via a halon piping penetration;
- Engineering Technical Evaluation, ETE-MP-2011-0045, providing use-as-is conclusion on terry turbine shaft pitting;
- ODM 000202, Operation with 2-RS-252, Loop 1A Pressurizer Spray Header Isolation Valve closed;

Unit 3

- RAS 000176 / CR419723, "Fire Shutdown Analysis Time Critical Operator Action (TCOA) to secure RCPs," dated March 28, 2011;
- CR427354, Degraded Condition for MOV 8701B and MOV 8702A RHR Isolations;
- ODM000192, "Addressing Increased Hydrogen Pressure in the VCT Creating an Increase in Unidentified RCS leakage and Increased Leakage From the 'D' RCP #1 Seal Leak-off," dated March 17, 2011; and

- IOD000173, "Initial Operability for Aluminum-Bronze Service Water Valves De-alloying," dated May 25, 2011.

b. Findings

Introduction: The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for Dominion's failure to take timely corrective actions for a condition adverse to quality involving the degradation and subsequent through-wall leakage of Unit 3 service water valves 3SWP\*V699 (3HVQ\*ACUS1B Bypass Valve), 3SWP\*V018 (3HVQ\*ACUS2B Unit Cooler Inlet Valve), and 3SWP\*V696 (3HVQ\*ACUS2B Unit Cooler Outlet Valve). Specifically, Dominion did not adequately implement a schedule for prioritizing and completing corrective actions on affected aluminum bronze components, which were known to be susceptible to de-alloying, commensurate with the safety significance of the degraded condition. As a result, through-wall leaks developed on these valves and resulted in unplanned loss of operability and additional unavailability of the safety-related support systems for the 'B' train of containment recirculation spray pumps.

Description: On May 25, 2011, through-wall leaks were identified on SW valves 3SWP\*V699, 3SWP\*V018, and 3SWP\*V696. These valves provide cooling water flow to the room air conditioning units that support the 'B' train of containment recirculation spray pumps. The leaks were caused by de-alloying of the aluminum bronze (Al-Br) valve bodies that had not been properly heat-treated to prevent the galvanic leaching of aluminum from the Al-Br metal matrix. Dominion had previously identified the susceptibility of these service water (SW) valves to de-alloying in apparent cause evaluation (ACE) 017509 dated March 30, 2009. Dominion had identified the de-alloying issue, characterized the de-alloying process, and determined that the cause was due to an old design issue where Al-Br valves had been procured without a specified heat-treatment that would have minimized the susceptibility of the valves to the de-alloying process. Dominion concluded in ACE 017509 that, "Based on past experience, this new valve (3SWP\*V699) will leak 12 to 18 months from installation." Dominion then prioritized all installed SW valves that were susceptible to de-alloying into four tiers based on their susceptibility and risk significance in the extent of condition assessment. Valves 3SWP\*V699, 3SWP\*V018, and 3SWP\*V696 were prioritized as "tier one" and should have been replaced promptly.

Dominion subsequently initiated CR428785 on May 25, 2011, to address through-wall leakage from these SW valves and completed OD000421 to assess operability and extent of condition. The leaking valves were replaced and the air conditioners (3HVQ\*ACUS1B and 3HVQ\*ACUS2B) were returned to service on May 26, 2011. The repeated failure of 3SWP\*V699 and the additional failures of 3SWP\*V018 and 3SWP\*V696 resulted in the loss of operability and additional unavailability of the 'B' train of containment recirculation spray pumps during valve replacement.

Analysis: The inspectors determined that the failure to take timely corrective action following identification of a degraded condition was a performance deficiency that was reasonably within Dominion's ability to foresee and prevent. Traditional Enforcement does not apply because the issue did not have any actual safety consequences or

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potential for impacting the NRC's regulatory function, and was not the result of any willful violation of NRC requirements.

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, the degraded condition caused a loss of operability of the 'B' train of the containment recirculation spray system. 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 of systems that respond to initiating events to prevent undesirable consequences. 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 it was not a design or qualification deficiency, did not represent an actual loss of system safety function of a single train for greater than its Technical Specification allowed outage time, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

The finding had a cross-cutting aspect in the Problem Identification and Resolution cross-cutting area, Corrective Action Program component, because Dominion did not ensure that issues potentially impacting nuclear safety were corrected in a timely manner commensurate with their safety significance. Specifically, Dominion failed to adequately implement corrective actions in a timely fashion to address a known de-alloying issue with SW valves before the condition led to the inoperability and unavailability of the safety-related support systems for the 'B' train of containment recirculation spray pumps [P.1(d)].

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 March 30, 2009, to May 25, 2011, Dominion did not take timely corrective actions to correct the de-alloying of Al-Br SW valves prior to the condition adversely impacting 'B' containment recirculation spray system operability. Dominion took immediate corrective action to replace the three leaking SW valves. Because the issue is of very low safety significance (Green) and has been entered into Dominion's CAP (CR428785), the NRC is treating this finding as an NCV, consistent with the NRC's Enforcement Policy. **(NCV 05000423/2011003-01, Failure to Take Timely Corrective Actions for De-alloying of Aluminum Bronze Service Water Valves).**

1R18 Plant Modifications (71111.18 – 4 samples)a. Inspection Scope

To assess the adequacy of the modifications, the inspectors performed walkdowns of selected plant systems and components, interviewed plant staff, and reviewed applicable documents, including procedures, calculations, modification packages, engineering evaluations, drawings, corrective action program documents, the UFSAR, and TS.

For the modifications reviewed, the inspectors determined whether selected attributes (component safety classification, energy requirements supplied by supporting systems, seismic qualification, instrument setpoints, uncertainty calculations, electrical coordination, electrical loads analysis, and equipment environmental qualification) were consistent with the design and licensing bases. Design assumptions were reviewed to verify that they were technically appropriate and consistent with the UFSAR. For each modification, the 10 CFR 50.59 screenings or safety evaluations were reviewed. The inspectors also verified that procedures, calculations, and the UFSAR were properly updated with revised design information. In addition, the inspectors verified that the as-built configuration was accurately reflected in the design documentation and that post-modification testing was adequate to ensure the structures, systems, and components would function properly. Documents reviewed during the inspection are listed in the Attachment. The following plant modifications were inspected:

Unit 2

- MP2-10-01037-000, "MP2 Motor Driven AFW Pump Bearing Replacement" (permanent);
- DM2-00-0110-01, "Installation of High Point Vents on H.P & L.P. Safety Injection & Containment Spray Suction Piping" (permanent);
- DM2-03-0183-09, "Temporary DCN Restoration Additional RTB Meter Relay Replacement Anomalies" (permanent); and
- MP2-11-01057, "MP2 MSSV Outlet Boot Design" (permanent).

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 9 samples)a. Inspection Scope

The inspectors reviewed post-maintenance test (PMT) activities to determine whether the PMT adequately demonstrated that the safety-related function of the equipment was satisfied, given the scope of the work specified, and that operability of the system was restored. In addition, the inspectors evaluated the applicable test acceptance criteria to evaluate consistency with the associated design and licensing bases, as well as TS

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requirements. The inspectors also evaluated whether conditions adverse to quality were entered into the corrective action program for resolution. Documents reviewed during the inspection are listed in the Attachment. The following maintenance activities and PMTs were evaluated:

#### Unit 2

- SP 2613H, "Facility 2 ESF Integrated Test Data Sheet," Revision 010-02, following replacement of the 'B' Emergency Diesel Generator (EDG) channel heads on April 17, 2011;
- HyPot Testing on the Isophase following the Isophase Duct Seal Plate Installation on April 19, 2011;
- SP 2660-001, "AFP Turbine Overspeed Trip Test," Revision 005-06, on April 21, 2011 and SP2619BS-003, "TDAFP Comprehensive Pump Test (MODE 3)," Revision 001-03, on May 2, 2011 following the overhaul of the Terry Turbine;
- SP 2601C-009, "Chemical and Volume Control System (CVCS) Valve Remote Position Indication IST, Facility 2," Revision 000-00, and SP 2601C-008, "CVCS Valve Stroke and Timing IST, Facility 2," Revision 000-00, following overhaul of 2-CH-514;
- C SP 760-003, "Battery DB3-201D Discharge Inspection," Revision 002-01, following battery replacement on April 10, 2011;
- SP 2610E, "MSIV Closure and Main Steam Valve Operational Readiness Testing," Revision 011-03, following leak injection repair of 2-MS-190B;
- SP 2613-B-001, "Periodic DG Operability Test, Facility 2 (Fast Start, Loaded Run)," Revision 021-05, following 'B' EDG governor replacement;
- SP 2411, "CEA Motion Inhibit Verification," Revision 002-08, following CEAPIDs monitor failure; and

#### Unit 3

- SP 3646A.1-003, "EDG 'A' Air Start Valves Independence Test," Revision 010, and SP 3646A.1-001, "EDG 'A' Operability Tests," Revision 018-01, following repair of a jacket water leak and replacement of the air start filter.

b. Findings

No findings were identified.

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1R20 Refueling and Other Outage Activities (71111.20 – 1 sample)Millstone Unit 2 Refueling Outage (2R20)a. Inspection Scope

Dominion began refueling outage 2R20 on April 2, 2011, and completed the outage on May 4, 2011. The inspectors evaluated the outage plan and outage activities to determine if Dominion had considered risk, developed risk reduction and plant configuration control methods, considered mitigation strategies in the event of loss of safety functions, and adhered to licensee and TS requirements. The inspectors observed portions of the shutdown, cooldown, heat up, and start up processes. Additionally, the inspectors performed an initial containment Mode 3 walk down to evaluate the as-found condition of containment. The inspectors also performed a final Mode 3 walk down to ensure that no loose material or debris, which could be transported to the containment sump, were present. The inspectors reviewed CRs to determine if conditions adverse to quality were entered for resolution. Documents reviewed for the inspection are listed in the Attachment. Some of the specific activities the inspectors observed and performed included:

- Scaffolding walkdown for potential interference with SSCs;
- Reactor shutdown and cool down;
- Reactor water level drain down to the reactor flange;
- Midloop and reduced inventory operations;
- Fuel handling, core loading, and fuel element assembly tracking;
- Containment as-found walk down;
- Review of outage risk plan;
- Orange Risk – Replacement of service water valve 2SWP-97B;
- Risk Mitigation Plan for the North Bus Outage;
- Generic Letter 88-17 verification;
- Refueling Seal Inspection;
- Containment as-left walk down;
- Reactor Heat-up;
- Reactor Start-up;
- Low Power Physics Testing;
- Reactor power ascension;
- Unit 2 Generator synchronization to the grid;
- Review of Work Schedules for Operations, Maintenance, and Security; and
- Fatigue Management.

b. Findings

No findings were identified.



1R22 Surveillance Testing (71111.22 – 9 samples)a. Inspection Scope

The inspectors reviewed surveillance activities to determine whether the testing adequately demonstrated equipment operational readiness and the ability to perform the intended safety-related function. The inspectors attended pre-job briefings, reviewed selected prerequisites and precautions to determine if they were met, and observed the tests to determine whether they were performed in accordance with the procedural steps. Additionally, the inspectors reviewed the applicable test acceptance criteria to evaluate consistency with associated design bases, licensing bases, and TS requirements, and that the applicable acceptance criteria were satisfied. The inspectors also evaluated whether conditions adverse to quality were entered into the corrective action program for resolution. Documents reviewed during the inspection are listed in the Attachment. The following surveillance activities were evaluated:

Unit 2

- SP 2610E, "MSIV Closure and Main Steam Valve Operational Readiness Testing," Revision 11-02 (IST);
- SP 2730B-001, "Main Steam Safety Valve Testing," Revision 011;
- SP 2613H, "Integrated Test of Facility 2 Components (ICCE)," Revision 012-02;
- SP 2602E-001, "Pressurizer Heater Capacity Test," Revision 000-00;
- SP 2651N-001, "Main Control Valves Operability Test," Revision 002-09;
- PT 21415A, "MP2 Inverters 1-4 Tests," Revision 004-02;

Unit 3

- SP 3622.3, "TDAFW Pump Operational Readiness and Quarterly IST Group 'B' Pump Tests," Revision 017-03;
- SP 3556B12, "SSPS Train 'B' Operational Test," Revision 012-04; and
- CP 3802E, "Reactor Coolant gas Sampling and Analysis," Revision 002-01.

b. Findings

Introduction: The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for Dominion's failure to take timely corrective action to address repetitive out of calibration conditions associated with safety-related 120 VAC Unit 2 inverters.

Description: Millstone Unit 2 safety-related inverters 1 through 4 supply power to safety-related 120VAC instrument panels. In April 2011, during refueling outage 2R20, inverters 1 through 4 were found outside the acceptance criteria for the under-frequency and over-frequency transfer limiter test. The over-frequency and under-frequency limits were adjusted back into the acceptance criteria; however, these inverters have had a history of drifting outside their acceptance criteria. In March 2009, the NRC documented an NCV for the inverters being found frequently out of calibration for over-frequency and

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under-frequency between 2005 and 2008 (NRC inspection report 05000336&423/2009006). Dominion wrote CR333435 which requested a setpoint change to address the issue identified in the NCV. This request was approved in a Request for Engineering Assistance (REA), but has not been funded to date. Additionally, during the Problem Identification and Resolution team inspection in February 2010, NRC inspectors noted that three of the inverters had over-frequency and under-frequency transfer limits outside acceptance criteria during testing in October 2009, and that corrective action had not been implemented.

Dominion performed an assessment of the system impact of the over- and under-frequency transfer limits and determined that the equipment supplied by the inverters are designed for a wide range of frequencies, and are insensitive to the small frequency band set by the over- and under-frequency transfer limit setpoints. Dominion concluded that the out-of-tolerance over- and under-frequency transfer limits do not present a safety concern and that the inverters remained operable. The inspectors reviewed Dominion's assessment and reached the same conclusion. Dominion's corrective actions will be to perform the detailed analysis necessary to increase the allowable tolerances of the over- and under-frequency setpoints from the current +/- 0.1 Hz .

Analysis: The inspectors determined that the failure to take timely corrective action to address the repetitive out of calibration over-frequency and under-frequency transfer limits was a performance deficiency that 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, impacts on the NRC's ability to perform its regulatory function, or willful aspects of the finding.

The inspectors determined the finding was more than minor because it is similar to the more than minor Example '4f' of NRC Inspection Manual Chapter (IMC) 0612, Appendix E, "Examples of Minor Issues." Additionally, the issue is more than minor because the performance deficiency can be reasonably viewed as a precursor to a significant event; in that, the history of over- and under-frequency limits drifting out of tolerance could lead to the unavailability of safety-related equipment powered from the inverters. The inspectors conducted a Phase 1 screening in accordance with NRC IMC Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," and determined that the finding was of very low safety significance (Green) because it was not a design or qualification deficiency, did not represent a loss of system safety function, did not represent an actual loss of safety function of a single train, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

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 take appropriate corrective action in a timely manner to address the repetitive out of calibration conditions with the 120 VAC safety related inverters. [P.1(d)]

Enforcement: 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," states, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, and defective material and equipment,

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and nonconformances are promptly identified and corrected. Contrary to the above, from March 2009, until June 2011, Dominion failed to take timely corrective action to address the repetitive out of calibration conditions associated with the 120 VAC safety related inverters. To date, Dominion has taken corrective action to adjust the over-frequency and under-frequency transfer limits. Because this violation was of very low safety significance and was entered into Dominion's corrective action program (CR426589), this violation is being treated as an NCV, consistent with the NRC's Enforcement Policy. **(NCV 0500336/2011003-02 Untimely Corrective Action for Safety Related Inverters Leads to Repetitive Out of Calibration Results)**

**Cornerstone: Emergency Preparedness (EP)**

1EP6 Drill Evaluation (71114.06 - 1 sample)

Classification and Notification during Requalification Training

a. Inspection Scope

The inspectors reviewed the operator's emergency classification and notification completed during Unit 2's requalification training on June 7, 2011. The inspectors verified the classification and notification were accurate and timely.

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 (1 sample)

During the period April 18, 2011 through April 21, 2011, the inspectors performed the following activities to verify that Dominion was evaluating, monitoring, and controlling radiological hazards for work performed during the 2R20 refueling outage in locked high radiation areas (LHRA) and other radiological controlled areas. Implementation of these controls was reviewed against the criteria contained in 10 CFR Part 20, Technical Specifications, and with Dominion's procedures.

Radiological Hazards Control and Work Coverage

The inspectors identified work performed in radiological controlled areas in Unit 2 and evaluated Dominion's assessment of the radiological hazards. The inspectors evaluated the survey maps, exposure control evaluations, electronic dosimeter dose/dose rate alarm set points, and radiation work permits (RWP) associated with these areas to determine if the exposure controls were acceptable. Specific work activities evaluated

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included inspection/removal of a damaged incore instrument (ICI) thimble tube (RWP 391) from the ICI plate and reinstalling the ICI plate and Upper Guide Structure (UGS) in the reactor vessel (RWP 302). For these tasks, the inspectors attended the pre-job briefings and discussed the job assignments with the workers. The inspectors also observed (from the centralized monitoring system and during containment tours), the implementation of exposure controls for disassembling/removing scaffolding from containment (RWP 331), re-installing insulation (RWP 326), and demobilization of SG tasks (RWP 307).

The inspectors reviewed the air sample records for samples taken prior to installing SG nozzle dams 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 2 containment building, the inspectors verified that continuous air monitors were strategically located to assure that potential airborne contamination could be timely identified and that the monitors were located in low background areas.

The inspectors toured accessible radiologically controlled areas (RCA) in the Unit 2 containment 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 jobs, and the associated controls.

Additionally, the inspectors reviewed the RWPs developed for other work performed during 2R20 including installation of permanent shielding and diving operations. In particular, the inspectors reviewed the electronic dosimeter dose/dose rate alarm set points, 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, and work site radiological conditions. By observing work-in-progress, the inspectors determined that stay times were appropriately monitored by supervision to assure no procedural limit was exceeded. Jobs observed included inspection of a damaged ICI thimble tube and preparations for moving the UGS.

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.

The inspectors inventoried the keys to LHRAs to determine if the keys were appropriately controlled, as required by procedure. The inspectors discussed with radiation protection supervision the procedural controls for accessing LHRAs and VHRAs and determined that no changes have been made to reduce the effectiveness and level of worker protection.

#### Contamination and Radioactive Material Control

During tours of containment, the inspectors confirmed that contaminated materials were properly bagged, surveyed/labeled and segregated from work areas. The inspectors observed workers using contamination monitors to determine if various tools/equipment were potentially contaminated and met criteria for releasing the materials from the RCA.

#### Radiological Hazards Control and Work Coverage

By observing preparations for inspecting/removing a damaged ICI thimble tube, 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 communication was established between the workers and the centralized monitoring system. Stay times were properly measured and supervisory personnel controlled the movements of the workers to assure that exposure was minimized.

#### Radiation Worker Performance

During job performance observations, the inspectors determined that workers complied with RWP requirements and were aware of radiological conditions 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 Nuclear Oversight field observation (2R20 outage snapshots) reports, dose/dose rate alarm reports, personnel contamination event reports and associated CRs, were conducted to determine if identified problems and negative performance trends were entered into Dominion's CAP and evaluated for resolution and to determine if an observable pattern traceable to a similar cause was evident.

Relevant CRs, associated with radiation protection control access and radiological hazard assessment, initiated between January 2011 and March 2011, were reviewed and discussed with Dominion 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 (1 sample)

During the period April 18, 2011 through April 21, 2011, the inspectors performed the following activities to verify that Dominion was properly implementing operational, engineering, and administrative controls to maintain personnel exposure as low as reasonably achievable (ALARA) for tasks performed during the Unit 2 refueling outage 2R20. Implementation of this program was reviewed against the criteria contained in 10 CFR Part 20, applicable industry standards, and with Dominion's procedures.

Radiological Work Planning

The inspectors reviewed pertinent information regarding site cumulative exposure history, current exposure trends, and exposure challenges for the Unit 2 outage. The inspectors reviewed various 2R20 Outage ALARA Plans.

The inspectors reviewed the exposure status for tasks performed during the Unit 2 outage and compared actual exposure with forecasted 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 the 5 person rem limit. These jobs included reactor vessel disassembly/reassembly (AP 2-11-01), SG inspections/maintenance (AP 2-11-09), scaffolding installation/removal (AP 2-11-13), insulation removal/installation (AP 2-11-14), and radiation protection support activities (AP 2-11-26).

The inspectors reviewed the Work-In-Progress ALARA reviews for those jobs whose actual dose approached the forecasted estimate. The inspectors evaluated the departmental interfaces between radiation protection, operations, maintenance crafts, and engineering to identify missing ALARA program elements and interface problems. The evaluation was accomplished by interviewing site staff, reviewing outage Work-in-Progress reviews, and reviewing recent Station ALARA Council (SAC) meeting minutes. Included was a review of the exposure controls for the 'C' reactor coolant pump (RCP) motor and seal replacement, and scaffolding installation.

Verification of Dose Estimates

The inspectors reviewed the assumptions and basis for the 2R20 outage ALARA forecasted exposure. The inspectors also reviewed the revisions made to various outage project dose estimates due to a reduced source term (i.e., lower dose rates); e.g., reactor disassembly/reassembly activities, reactor coolant pump maintenance, and SG maintenance.

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The inspectors evaluated the implementation of Dominion procedures associated with monitoring and re-evaluating dose estimates and allocations when the forecasted cumulative exposure for tasks exceeded the actual exposure. 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 lower dose goals from the original estimates.

Additionally, the inspectors reviewed the exposures for the ten workers receiving the highest doses for 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 2 source term. Through review of survey maps and interviews with the Radiation Protection Manager, the inspectors evaluated recent source term measurements and control strategies. Specific strategies being employed included use of macro-porous clean up resin, enhanced operational chemistry controls, and installation of permanent/temporary shielding.

The inspectors reviewed the effectiveness of temporary shielding by reviewing pre/post-installation radiation surveys for selected components having elevated dose rates. Shielding packages reviewed included those placed on the reactor head stand, pressurizer spray piping, SG penetrations, and RCP piping.

#### Job Site Inspections

During plant tours, the inspectors assessed the implementation of ALARA controls specified in ALARA Plans and RWPs, for ICI thimble tube cutting/removal, RCP maintenance, and SG tube inspections, performed during 2R20.

The inspectors also observed workers performing SG demobilization from eddy current testing, ICI inspections, and scaffolding removal. Workers were questioned regarding their knowledge of job site radiological conditions and ALARA measures applied to their tasks.

#### Problem Identification and Resolution

The inspectors reviewed elements of Dominion's 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 (1 sample)

During the period April 18, 2011 through April 21, 2011, the inspectors performed 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 with Dominion's procedures.

Engineering Controls

The inspectors evaluated the use of portable continuous air monitors (AMS-4) and portable HEPA ventilation systems installed in containment during the 2R20 outage. The inspectors determined that the monitors were located at work locations; e.g., SG primary side openings, in containment where airborne contamination could potentially occur. The inspectors reviewed testing records for portable HEPA ventilation systems to determine that procedural performance criteria were met.

Respiratory Protection

The inspectors reviewed the use of respiratory protection devices worn by workers. The inspectors reviewed air sampling records, SG channel head removable contamination data, RWPs, and Total Effective Dose Equivalent (TEDE) ALARA 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.

Problem Identification and Resolution

The inspectors reviewed elements of Dominion's CAP related to implementing the airborne monitoring 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 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 (1 sample)

During the period April 18, 2011 through April 21, 2011, the inspectors performed the following activities to verify the accuracy and operability of personal monitoring equipment and the effectiveness in determining a worker's TEDE. Implementation of these programs was evaluated against the criteria contained in 10 CFR Part 20, applicable industry standards, and with Dominion's procedures.

External Dosimetry

The inspectors verified that Dominion's dosimetry processor was accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). The inspectors verified that the approved dosimeter irradiation categories were consistent with the types and energies of the site's source term. The inspectors reviewed Dominion's audit of the dosimetry processor and the areas identified for improvement contained in the report.

The inspectors confirmed that Dominion has developed "correction factors" to address the response differences of electronic dosimeters as compared to thermoluminescent dosimeters (TLD).

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 10 CFR Part 61 samples.

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 three whole body counts to assess the adequacy of the counting time, background radiation contribution, and the nuclide library used for assessing deposition. No individual exposure exceeded a committed effective dose equivalent (CEDE) of 10 mrem.

Declared Pregnant Workers

The inspectors reviewed the procedural controls, and associated records, for managing declared pregnant workers (DPW) and determined that three DPWs were employed during the Unit 2 outage. The inspectors reviewed the individual exposure results and monitoring controls to assure compliance with 10 CFR Part 20.

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### Multi-Dosimetry Methods

The inspectors reviewed Dominion's procedures for monitoring external dose where significant dose gradients exist at the work site. For 2R20, multi-dosimetry methods were used, instead of external effective dose equivalent (EDEX) methods. The inspectors reviewed the dosimetric results for jobs where workers wore multiple dosimeters. These jobs included SG nozzle installations, fuel transfer equipment repair, and diving operations. The inspectors confirmed that in addition to the TLDs worn, workers also wore electronic dosimeters, equipped with telemetry, to assure that dose fields were promptly monitored by radiation protection technicians in the centralized monitoring station.

### Problem Identification and Resolution

The inspectors reviewed elements of Dominion's CAP 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, CR related to dose assessments, personnel contaminations, and dose/dose rate alarms were reviewed.

#### b. Findings

No findings were identified.

### 2RS05 Radiation Monitoring Instrumentation (71124.05 - 1 sample)

#### a. Inspection Scope (1 sample)

During the period May 23, 2011 through May 26, 2011, the inspectors performed the following activities to evaluate the operability and accuracy of radiation monitoring instrumentation used to detect and quantify effluent releases. Implementation of these programs was reviewed against the criteria contained in 10 CFR Part 20, applicable industry standards, and with Dominion's procedures.

#### Walk-down of Effluent Monitoring Systems

The inspectors walked down selected portions of the liquid and gaseous monitoring systems installed in Unit 2 and Unit 3 to assess material condition, observe maintenance/calibration activities, and determine the status of system upgrades.

In Unit 2, the walkdown included portions of the following monitors:

#### Gaseous Effluent Monitors

- Enclosure Building Roof Vent Monitor, RM-8132 A/B
- Fuel Handling Building Exhaust, RM-8145
- Radwaste Building Exhaust, RM-8997
- Auxiliary Building Exhaust, RM-8434

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- Stack Monitor – Wide Range, RM-8169
- Waste Gas Tank Monitor, RM-9095
- Steam Jet Air Ejector Monitor, RM-5099

#### Liquid Effluent Monitors

- Clean Liquid Waste Effluent Monitor, RM-9049
- Aerated Liquid Waste Effluent Monitor, RM-9116
- Steam Generator Blow-down Monitor, RM-4262
- Condensate Receiving Tank Monitor, RM-9327
- Reactor Building Component Cooling Water Monitor, RM-6038

In Unit 3, the walkdown included portions of the following monitors:

#### Gaseous Effluent Monitors

- Ventilation Vent Monitor, RE-10A/B
- Supplemental Leak Collection and Release System (SLCRS) Monitor, RE 19A/B
- Engineered Safeguards Building Monitor, RE-49

#### Liquid Effluent Monitors

- Turbine Building Sump Monitor, RE-50
- Liquid Waste Effluent Monitor, RE-70
- Waste Neutralization Sump Monitor, RE-07

#### Calibration and Testing Program

Through record reviews, the inspectors confirmed that the effluent monitoring instruments were properly calibrated, and that the required source checks and functional tests had been routinely performed. The inspectors verified that the effluent monitor alarm set points are established in accordance with the Off Site Dose Calculation Manual (ODCM).

The inspectors reviewed contamination sampling results (per 10 CFR Part 61) used to characterize difficult-to-measure radioisotopes, to determine if the calibration sources were representative of the radioisotopes found in the plant's source term.

#### Problem Identification and Resolution

The inspectors reviewed selected CRs, system health reports, and various Nuclear Quality Assurance reports to evaluate Dominion's threshold for identifying, evaluating, and resolving problems for the radiation monitoring instrumentation. Included in this review were CRs related to radiation worker and radiation protection technician errors to determine if an observable pattern traceable in the maintenance or use of radiation instruments was evident.

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b. Findings

No findings were identified.

2RS06 Radioactive Gaseous and Liquid Effluent Treatment (71124.06 - 1 sample)

a. Inspection Scope (1 sample)

During the period May 23, 2011 through May 26, 2011, the inspectors performed the following activities to verify that Dominion was properly maintaining the gaseous and liquid effluent processing systems to ensure that radiological releases were properly mitigated, monitored, and evaluated with respect to public exposure. Implementation of these controls was reviewed against the criteria contained in the 10 CFR Parts 20 and 50, of Dominion's Radiological Effluent Monitoring and Offsite Dose Calculation Manual (REMODOCM), and with Dominion's procedures.

Effluent Report Reviews

The inspectors reviewed the 2009 and 2010 Annual Radiological Effluent Release Reports to verify that the effluents program was implemented as required by the REMODOCM. Included in this review were the results of the ground water protection program, the inclusion of Carbon-14 dose contributions, the current land use census, and verification that no significant changes were made to the Unit 2 and Unit 3 gaseous and liquid release system configurations, as specified in the Final Safety Analysis Report (FSAR) and ODCM descriptions.

Walkdowns and Observations

The inspectors walked down the major components of the Unit 2 and Unit 3 gaseous and liquid release systems, to verify the system configurations complied with the FSAR description, and to evaluate equipment material condition.

The inspectors reviewed the most current Unit 2 and Unit 3 liquid and gaseous effluent monitor monthly source checks, quarterly functional test results and 18-month calibration records to verify that instrumentation and associated pumps/isolation valves or fans/isolation dampers, respectively, were operable.

The inspectors reviewed the air cleaning systems surveillance test results for the HEPA and charcoal filtration systems installed in Unit 2 and Unit 3. The inspectors confirmed that the air flow rates were consistent with the FSAR values and the filtration system met the acceptance criteria.

Sampling and Analysis

The inspectors reviewed the relevant surveillance procedures (SP) and observed technicians collecting weekly air particulate and iodine samples. Airborne particulate and iodine samples were taken from the Main Station Stack monitor (RM-8169), using

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SP-2815. Samples were taken from the Unit 2 Enclosure Building roof vent monitor (RM-8132), using SP-2814A.

During the walkdowns of effluent monitoring systems, the inspectors determined that appropriate compensatory sampling measures were implemented for monitors that were removed from service for maintenance or calibration. Compensatory measures were in place for the U-2 Ventilation Vent monitor (RM-8132), Unit 3 SCLRS monitor (HVR-19), and Unit 3 Liquid Waste monitor (LWS-RE-70).

The inspectors reviewed the results of Dominion's inter-laboratory comparison (blind sample) program to verify the accuracy of effluent sample analysis performed by Dominion.

#### Dose Calculations

The inspectors reviewed monthly, quarterly, and annual dose projections for liquid and gaseous effluents performed during the past 12 months to verify that the effluent was processed and released in accordance with REMODCM requirements and to ensure that the licensee properly calculated the offsite dose from effluent releases. The inspectors confirmed that no performance indicator (criteria contained in Appendix I to 10 CFR 50) was exceeded for these releases.

The inspectors reviewed liquid discharge permits for Unit 2 and Unit 3 to evaluate the adequacy of dilution flow, radioactive content, and overall accuracy of the documented data.

#### Ground Water Protection Program

The inspectors verified that Dominion is continuing to implement the voluntary Nuclear Energy Institute/Industry Ground Water Protection Initiative. The inspectors reviewed monitoring well sample results, trending data, and decommissioning records (maintained per 10 CFR 50.75 (g)) to evaluate procedural compliance and to identify off normal results.

#### Problem Identification and Resolution

The inspectors reviewed selected CRs, system health reports, and Nuclear Quality Assurance audits to evaluate Dominion's threshold for identifying, evaluating, and resolving problems regarding effluent treatment and monitoring.

b. Findings

No findings were identified.

4. **OTHER ACTIVITIES [OA]**4OA1 Performance Indicator (PI) Verification (71151 – 6 samples)Cornerstone: Initiating Eventsa. Inspection Scope

The inspectors reviewed Dominion submittals for the PIs listed below to verify the accuracy of the data reported during that period. The PI definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Indicator Guideline," Revision 5, were used to verify the basis for reporting each data element. The inspectors reviewed portions of the operations logs, monthly operating reports, and Licensee Event Reports (LER) and discussed the methods for compiling and reporting the PIs with cognizant licensing and engineering personnel.

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; and
- Unplanned Transients per 7000 Critical Hours.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152).1 Review of Items Entered into the Corrective Action Programa. Inspection Scope

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into Dominion's corrective action program. This was accomplished by reviewing the

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description of each new CR and attending daily management review committee meetings.

b. Findings

No findings were identified.

.2 Annual Sample: Assessment of Current Performance in the Cross-Cutting Aspect H.1[b]

a. Inspection Scope (1 sample)

The inspectors reviewed Dominion's current performance relevant to the cross-cutting aspect, [H.1 (b)] Human Performance, Decision Making. Licensee Decisions demonstrate that nuclear safety is an overriding priority, and Dominion uses conservative assumptions in decision making and adopts a requirement to demonstrate that the proposed action is safe in order to proceed, rather than a requirement to demonstrate that it is unsafe in order to disapprove the action. Dominion conducts effectiveness reviews of safety-significant decisions to verify the validity of the underlying assumptions, identifies possible unintended consequences, and determines how to improve future decisions. Millstone was noted to have three ROP findings with this associated cross-cutting aspect in the last assessment period. The inspectors reviewed related CRs, interviewed staff personnel, conducted behavioral observations of staff interactions during several meetings and training sessions, and developed a case study of Dominion's response to the Unit 2 reactor trip on June 20, 2011.

b. Findings and Observations

No findings were identified.

The inspectors determined that Dominion had identified the trend in the cross-cutting aspect [H.1(b)] in their CAP (CR403111). Dominion had conducted a common cause evaluation of the cross-cutting area [H.1(b)] (CCE000164) and concluded that "no common cause, most prevalent cause related to Conservative Assumptions and Safe Actions was derived from the review of these three events." The inspectors noted that, at the end of the current quarter, Dominion will have only one finding with a cross-cutting aspect [H.1(b)] in this reporting period because two of the findings are no longer current and no additional findings have assigned [H.1(b)] as a cross-cutting aspect. The inspectors reviewed CCE000164 and noted that this evaluation was somewhat narrowly focused on the three individual findings. While Dominion concluded that there was no common cause, they broadened the scope of this evaluation and determined there was a common theme across the three events that included some aspect of inadequate worker knowledge and appropriate risk recognition. They subsequently addressed this common theme by implementing corrective actions for the three findings (CA170523, CA183044 and CA191587) by conducting training on the specific issues.

The inspectors followed Dominion's response to the Unit 2 reactor trip that occurred on June 20, 2011, as a real time case study in the effectiveness of the Millstone conservative decision making process. Dominion immediately prepared CRs that

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addressed the human performance errors (CR431574 RCE), procedural issues (CR431722) and simulator fidelity issues (CR432012) and is presently conducting a root cause evaluation (RCE) of the event. Prior to restarting the reactor, the inspectors observed a management meeting to implement procedural changes prior to restart, just-in-time training (JITT) for the crew supporting the restart, and the lessons learned training on critical parameter monitoring (CR431936) conducted after the event for the remediation of all shifts. These activities observed in this case study demonstrated an appropriate emphasis on conservative decision making, critical parameter monitoring by operators and a focus on operator fundamentals. In addition, the inspectors observed Supervisor Leadership Training conducted by the Plant Manager that reemphasized the safety culture aspects, expectations and responsibilities of front line supervisors. This included lessons learned from the response to this event. Based on this sample, it appears that Dominion has recognized the implications of the trend in the cross-cutting aspect [H.1(b)]. Current efforts to address this aspect are in progress within the Dominion CAP and will be assessed in the future after the RCE has been completed, and when lessons learned and corrective actions to prevent recurrence have been formulated and implemented.

3. Annual Sample: Assessment of Current Performance in the Cross Cutting Aspect P.1[a]

a. Inspection Scope (1 sample)

The inspectors reviewed Dominion's current performance relevant to the cross-cutting aspect [P.1(a)]: Problem Identification and Resolution, Corrective Action Program. Dominion ensures that issues potentially impacting nuclear safety are promptly identified, fully evaluated, and that actions are taken to address safety issues in a timely manner, commensurate with their significance. Dominion implements their CAP with a low threshold for identifying issues. Dominion identifies such issues completely, accurately, and in a timely manner commensurate with their safety significance. At the end of the last ROP assessment period, Dominion was noted to have three ROP findings with this associated cross-cutting aspect and at the end of the current quarter. Dominion will continue to have the same three findings with a cross-cutting aspect [P.1(a)] in this assessment period because no additional findings have been added and the three original findings occurred within the past four quarters. The inspectors reviewed related CRs, interviewed staff personnel, conducted behavioral observations of staff interactions during several meetings and training sessions, and developed a case study of Dominion's response to the Unit 2 reactor trip on June 20, 2011.

b. Findings and Observations

No findings were identified.

The inspectors assessed Dominion's response to the area of identifying, fully evaluating and addressing safety issues in a timely manner. The inspectors determined that



Dominion had identified a trend in the safety culture cross-cutting aspect [P.1(a)] and had concluded that the three ROP findings had been properly evaluated and closed individually. Dominion did not perform a common cause assessment for the cross-cutting aspect [P.1(a)]. During this ROP inspection period, no additional findings were identified that involved [P.1(a)].

Interviews with Dominion managers indicated that Millstone was planning to further address the broader issue of corrective action program effectiveness by making improvements to their CAP including improving the quality of their apparent cause evaluations (ACE) and root cause evaluations (RCE); strengthening the effectiveness of the Corrective Action Review Board (CARB); initiating CRs for all rejected ACEs and RCEs; and enhancing the minimum required qualifications and training for CARB members. They also were planning to conduct a sampling of lower level CR evaluations to determine if they were missing key trends and reducing the extension of corrective action due dates. Other corrective actions will be considered based on the results of the common cause assessment for this trend that is presently in progress. The inspectors noted that Millstone staff initiates a substantial volume of CRs every year and the threshold for preparing a CR appeared to be appropriately low. There appeared to be little reluctance to drafting a CR by the vast majority of the staff at Millstone.

The inspectors followed Dominion's response to the Unit 2 reactor trip that occurred on June 20, 2011, as a real time case study in the effectiveness of the Millstone corrective action process. Dominion immediately prepared CRs that addressed the human performance errors (CR431574 RCE), procedural issues (CR431722) and simulator fidelity issues CR432012, and is presently conducting a RCE of the event. Prior to restarting the reactor, the inspectors observed a management meeting to implement procedural changes prior to restart, just-in-time training (JITT) for the crew supporting the restart, and the lessons learned training on critical parameter monitoring conducted after the event for all shifts. These activities demonstrated an appropriate threshold of problem identification, an ability to promptly resolve adverse conditions and effective corrective action implementation in response to this event. In addition, the inspectors observed Supervisor Leadership Training conducted by the Plant Manager that reemphasized the safety culture aspects, expectations and responsibilities of front line supervisors that included lessons learned from the response to this event. Based on this sample, it appears that Dominion has recognized the implications of the cross-cutting theme [P.1(a)]. Current efforts to address this theme are in progress and will be assessed in the future after the RCE has been completed and corrective actions to prevent recurrence have been implemented.

#### .4 Semi-Annual Problem Identification & Resolution (PI&R) Trend Review

##### a. Inspection Scope (1 sample)

The semi-annual trend review's focus was to determine Dominion's progress in correcting negative trends. The inspectors reviewed Dominion's corrective action trend report for the 3<sup>rd</sup> quarter 2010 and selected the work management trends for review. Work management was selected because it has been a site focus area for over a year. The inspectors reviewed corrective action assignments CA173666, CA177780,

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CA177781, and all corrective action assignments from apparent cause ACE 018411. The inspectors reviewed the trends and interviewed several maintenance and planning personnel in order to determine if the corrective action assignment matched the issue and if the corrective actions completely addressed the issue.

b. Assessments and Observations

No findings were identified.

The overall goal of the corrective actions was to address negative trends in meeting work management milestones, work order readiness, and backlog management. The inspectors determined that since February 2011, overall work management has been improving. Total backlog per unit has been reduced from 3946 to 3771 between February and May 2011. Critical and non critical PMs deferred per rolling quarter have dropped from 24 and 23 respectively in July 2010, to 6 and 0 in May 2011. T4 scope stability has been consistently at approximately 90 percent for several months. Dominion has started looking out to T16 to determine if overtime or contractor use will be required to complete the necessary work. Not all trends have been positive, as annualized critical and non critical PMs performed late in the grace period have steadily increased from 24 percent and 26.5 percent respectively in July 2010, to 31.6 percent and 34.3 percent in May 2011.

The inspectors identified that one corrective action was closed out before the work was completed. CA173666 was to evaluate the gap to excellence in schedule adherence. The work completed was a draft plan to efficiently use resources to plan and complete work. The draft plan has several tasks to implement other plans. The assignment was closed out without any documentation that the plan had been implemented. It appears that the plan is being implemented, but the details are not captured under that corrective action. There was one corrective action that the inspectors could not completely verify its completion. CA185790's assignment was to address work orders removed from the schedule because they did not meet the milestones. This assignment was closed primarily because of T4 scope stability and implementation week adherence greater than 90 percent.

4OA3 Event Follow-up (71153 – 2 samples).1 (Closed) LER 05000336/2011-001 Enclosure Building Rendered Inoperable Due to Dislodged Bushingsa. Inspection Scope

On April 3, 2011, Millstone Unit 2 Enclosure Building Filtration System (EBFS) negative pressure test results failed to meet acceptance criteria while the unit was in Mode 4, making the Enclosure Building inoperable. Since the Enclosure Building failed its surveillance test, its safety function to control the release of radioactive material could not be assured. Dominion determined that the cause for the failure was that the sliding bushings on the main steam safety valve (MSSV) exhaust piping had become stuck and were not seated properly.

b. Findings

Introduction: A self-revealing Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," was identified for Dominion's failure to take prompt corrective action to address the cause of MSSV exhaust pipe bushings not seating, which resulted in a loss of the Enclosure Building's safety function to control the release of radioactive material. Dominion has since cleaned and lubricated the MSSV exhaust pipe, and also implemented a modification to upgrade the MSSV outlet boot and qualify it as part of the Enclosure Building filtration boundary.

Description: On April 3, 2011, Millstone Unit 2 was performing a plant cool-down in Mode 5 when the data taken on the EBFS test while in Mode 4 indicated that it had not met its acceptance criteria. The Enclosure Building's safety function to control the release of radioactive material could therefore not be assured. Dominion determined that the cause of the failure was eight MSSV exhaust pipe bushings not being seated properly because they had become stuck on the exhaust pipe. Dominion performed cleaning and lubrication of the MSSV exhaust pipe and performed a successful retest on April 26, 2011. The Enclosure Building had also failed its surveillance test in July 2009 when two MSSV bushings had not seated. The 2009 investigation determined that the lifting of the relief valves associated with these bushings as a result of the July 3, 2009 trip had caused the bushings to slide up the exhaust pipe and become stuck. The bushings were reseated and a successful retest was performed.

One of the corrective actions from the 2009 root cause was to develop a new procedure for the inspection and cleaning of the sliding bushings. Details were to include lifting of the bushing, and to provide necessary tooling and criteria for clearances and cleanliness. Procedure MP2702F10A, "Cleaning and Inspection of MSSVs Sliding Bushings," was approved in November 2009. However, the work performed on the bushings was completed in October 2009, which occurred prior to the approval of procedure MP2702F10A. As a result, the work orders for the sixteen sliding bushings did not contain details for properly cleaning the bushings. The work orders only stated, "verify that the sliding bushing is free to slide on vent stack without excessive binding in

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accordance with MF 2701J-114.” For the eight bushings that were not seated, only three of the work orders’ comments stated that cleaning of the sliding bushing was performed. Dominion’s apparent cause evaluation from the April 2011 failure stated that a contributing cause was, “ineffective implementation of corrective actions from root cause RCE000984; inadequate/inconsistent maintenance cleaning approach may have resulted in MSSV sliding bushings hanging up.”

Analysis: The inspectors determined the failure to take prompt corrective action to clean the sliding bushings in October 2009 was a performance deficiency that 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, impacts on the NRC’s ability to perform its regulatory function, or willful aspects of the finding.

The finding was more than minor because it was associated with the Procedure Quality attribute of the Barrier Integrity cornerstone and affected the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, the failure of the MSSV sliding bushings to seat properly caused the EBFS to fail its surveillance test, and its safety function to control the release of radioactive material could not be assured. The inspectors conducted a Phase 1 screening in accordance with NRC Inspection Manual Chapter (IMC) Attachment 0609.04, “Phase 1 – Initial Screening and Characterization of Findings,” and determined that the finding was of very low safety significance (Green) because it only represents a degradation of the radiological barrier function provided for the auxiliary building.

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 take appropriate or timely corrective action to address the Enclosure Building surveillance test failure in 2009. [P.1(d)]

Enforcement: 10 CFR 50, Appendix B, Criterion XVI, “Corrective Action,” states, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, and defective material and equipment, and non-conformances are promptly identified and corrected. Contrary to the above, from October 2009 until April 2011, Dominion failed to take prompt corrective action to address the cause of the MSSV exhaust pipe bushings not seating properly, which caused the inoperability of the Enclosure Building and a loss of its safety function on April 3, 2011. Dominion took corrective action to clean and lubricate the MSSV exhaust pipe and also implemented a modification to upgrade the MSSV outlet boot and qualify it as part of the Enclosure Building filtration boundary. Because this violation was of very low safety significance and was entered into Dominion’s CAP (CR420485), this violation is being treated as an NCV, consistent with the NRC’s Enforcement Policy. **(NCV 0500336/2011003-03 Inadequate Corrective Action Results in Loss of Enclosure Building’s Safety Function.)**

## .2 Automatic Reactor Trip Due to Loss of Feedwater Flow

### a. Inspection Scope

On June 20, 2011, at 11:52 a.m., Unit 2 experienced an automatic trip on low steam generator level. The low steam generator level was caused by a loss of feedwater flow when the 'B' steam generator feedwater pump (SGFP) tripped on low suction pressure while the operators were in the process of bringing the 'A' SGFP on-line.

The inspectors responded to the control room and evaluated the adequacy of operator actions in accordance with approved procedures and TS requirements. The inspectors performed a walkdown of the control room and interviewed personnel to verify that the plant was stable. The inspectors also reviewed the sequence of events and post trip review report in order to determine if there were any other plant or equipment anomalies.

The inspectors observed the reactor startup and portions of the power ascension including the starting of the second SGFP. The inspectors reviewed CRs to ensure conditions adverse to quality associated with this event were entered into Dominion's corrective action program for resolution.

### b. Findings

Introduction: A self-revealing finding (FIN) of very low safety significance (Green) was identified for Dominion's failure to follow procedure OP 2204, "Load Changes," when starting the 'A' SGFP. Specifically, the operating crew failed to maintain adequate SGFP suction pressure (greater than 325 psig) while starting the 'A' SGFP, which led to a trip of the 'B' SGFP and subsequent reactor trip on low steam generator level.

Description: On June 20, 2011, Millstone Unit 2 reduced power to 30 percent to repair an oil leak on the 'C' reactor coolant pump (RCP) motor. Following the repairs, Millstone Unit 2 began increasing power to 59 percent with the 'B' SGFP feeding the steam generators. Operators were in the process of bringing the 'A' SGFP pump on-line when feed regulating valve (FRV) differential pressure (dp) decreased outside of the operating band. The operator then incorrectly lowered 'B' SGFP speed to increase FRV dp. The operator did not get the desired response, and increased 'B' SGFP speed back to its original value. The operator then increased the speed of the 'A' SGFP in order to bring the pump on-line to feed the steam generators. This action decreased feed pump suction pressure and caused the 'B' SGFP to trip on low suction pressure. The resulting loss of feedwater flow caused a reactor trip on low steam generator level at 11:52 a.m.

Dominion's post trip review identified some instances where operator actions were not as expected. OP 2204, "Load Changes", step 4.1.21 states, "When placing the second SGFP in service, THROTTLE open CNM-2, "COND DEMIN BYP," as needed to maintain both SGFP suction pressures greater than 325 psig (C-05)." CNM-2 was not throttled open by the operating crew and SGFP suction pressure was not maintained above 325 psig, nor was it adequately monitored. SGFP suction pressure dropped below 325 psig at 11:44 a.m., and at 11:50 a.m. the 'B' SGFP suction pressure low

alarm came in at 260 psig on the plant process computer (PPC). The operating crew took no corrective action in response to the alarm.

In addition, the post trip review also identified that recent revisions to procedure OP 2204, which delayed the start of the heater drain pumps until 70 percent reactor power and increased the reactor power band for starting a second SGFP from 45 percent – 50 percent to 45 percent – 65 percent, may not have been appropriate.

The inspectors noted that OP 2321, "Main Feedwater System," which contains the procedure for starting a second SGFP, does not mention monitoring SGFP suction pressure. It only states in the initial steps, "Verify the following: Condensate header pressure greater than 425 psig (C-05)." The inspectors also noted that JITT for the power ascension did not include starting the second SGFP, because other power ascension evolutions, such as synchronizing to the grid, were deemed to be more difficult.

Analysis: The inspectors determined the failure to adequately monitor and take corrective action when SGFP suction pressure dropped below 325 psig was a performance deficiency that 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, impacts on the NRC's ability to perform its regulatory function, or willful aspects of the finding.

The finding is more than minor because it is similar to NRC Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," Example 4b; in that, a failure to follow procedure led to a reactor trip. This issue is associated with the Human Performance attribute of the Initiating Events cornerstone and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the failure of the operators to properly monitor SGFP suction pressure led to a loss of adequate feedwater flow and a reactor trip. The inspectors conducted a Phase 1 screening in accordance with NRC Inspection Manual Chapter (IMC) Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," and determined that the finding was of very low safety significance (Green) because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available.

The inspectors determined that this finding had a cross-cutting aspect in the Human Performance cross-cutting area, Work Practices component, because Dominion personnel did not properly follow the load changes procedure. [H.4(b)]

Enforcement: This finding does not involve enforcement action because no regulatory requirement violation was identified. Dominion entered this issue into their corrective action program (CR431574); conducted training exercises emphasizing safe operating envelopes, critical parameters to monitor, and actions to take to restore margin if plant conditions degrade; and has revised procedure OP 2204. Because this finding does not involve a violation of regulatory requirements and has very low safety significance, it is

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identified as a finding. **(FIN 05000336/2011003-04 Failure to Follow Procedure for Starting a Second SGFP Results in Reactor Trip)**

40A5 Other Activities

.1 (Closed) NRC Temporary Instruction 2515/183, "Followup to the Fukushima Daiichi Nuclear Station Fuel Damage Event"

The inspectors assessed the activities and actions taken by the licensee to assess its readiness to respond to an event similar to the Fukushima Daiichi nuclear plant fuel damage event. This included (1) an assessment of the licensee's capability to mitigate conditions that may result from beyond design basis events, with a particular emphasis on strategies related to the spent fuel pool, as required by NRC Security Order Section B.5.b issued February 25, 2002, as committed to in severe accident management guidelines, and as required by 10 CFR 50.54(hh); (2) an assessment of the licensee's capability to mitigate station blackout (SBO) conditions, as required by 10 CFR 50.63 and station design bases; (3) an assessment of the licensee's capability to mitigate internal and external flooding events, as required by station design bases; and (4) an assessment of the thoroughness of the walkdowns and inspections of important equipment needed to mitigate fire and flood events, which were performed by the licensee to identify any potential loss of function of this equipment during seismic events possible for the site.

Inspection Report 05000245,336,423/2011009 (ML111320660) documented detailed results of this inspection activity.

.2 (Closed) NRC Temporary Instruction 2515/184, "Availability and Readiness Inspection of Severe Accident Management Guidelines (SAMGs)"

On May 13, 2011, the inspectors completed a review of the licensee's severe accident management guidelines (SAMGs), implemented as a voluntary industry initiative in the 1990's, to determine (1) whether the SAMGs were available and updated, (2) whether the licensee had procedures and processes in place to control and update its SAMGs, (3) the nature and extent of the licensee's training of personnel on the use of SAMGs, and (4) licensee personnel's familiarity with SAMG implementation.

The results of this review were provided to the NRC task force chartered by the Executive Director for Operations to conduct a near-term evaluation of the need for agency actions following the Fukushima Daiichi fuel damage event in Japan. Plant-specific results for Millstone Power Station were provided in an Attachment to a memorandum to the Chief, Reactor Inspection Branch, Division of Inspection and Regional Support, dated May 27, 2011 (ML111470361).

4OA6 Meetings, including Exit

Exit Meeting Summary

On August 1, 2011, the resident inspectors presented the overall inspection results to Mr. A. J. Jordan and members of his staff. The inspectors confirmed that no proprietary information was provided or examined during the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

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**SUPPLEMENTAL INFORMATION****KEY POINTS OF CONTACT**Dominion personnel

R. Arquaro	U3 Shift Manager
L. Armstrong	Manager, Training
G. Auria	Nuclear Chemistry Supervisor
B. Barron	Manager, Nuclear Oversight
B. Bartron	Supervisor, Licensing
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
J. Dorosky	Health Physicist III
M. Finnegan	Supervisor, Health Physics, ISFSI
J. Gauvin	Unit 3 Chemistry Technician
A. Gharakhanian	Nuclear Engineer III
M. Gobeli	Shift Technical Advisor
W. Gorman	Supervisor, Instrumentation & Control
J. Grogan	Assistant Operations Manager
K. Grover	Manager, Nuclear Operations
C. Houska	I&C Technician
A. Jordan	Site Vice President
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
M. Martel	U3 Shift Manager
C. Rheims	I&C Engineer
R. Riley	Supervisor, Nuclear Shift Operations Unit 3
M. Roche	Senior Nuclear Chemistry Technician
L. Salyards	Licensing, Nuclear Technology Specialist
M. Sartain	Director, Nuclear Engineering
J. Semancik	Plant Manager
A. Smith	Asset Management
D. Smith	Manager, Emergency Preparedness
S. Smith	Manager, Engineering
J. Stoddard	Unit 3 Shift Manager
R. Sturgis	Secondary Systems Engineering Supervisor
M. Socha	Unit 3 Work Control SRO
S. Turowski	Supervisor, Health Physics Technical Services
C. Vournazos	IT Specialist, Meteorological Data
P. Zahn	Operations Support Specialist

**LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**Opened and Closed

05000423/2011003-01	NCV	Failure to Take Timely Corrective Actions for De-alloying of Aluminum Bronze Service Water Valves (Section 1R15)
05000336/2011003-02	NCV	Untimely Corrective Action for Safety Related Inverters Leads to Repetitive Out of Calibration Results (Section 1R22)
05000336/2011003-03	NCV	Inadequate Corrective Action Results in Loss of Enclosure Building's Safety Function (Section 4OA3)
05000336/2011003-04	FIN	Failure to Follow Procedure for Starting a Second SGFP Results in Reactor Trip (Section 4OA3)

Closed

05000336/2011-001	LER	Enclosure Building Rendered Inoperable Due to Dislodged Bushings
05000245,336,423/2515/183	TI	Follow-up to the Fukushima Daiichi Nuclear Station Fuel Damage Event (Section 4OA5.1)
05000336,423/2515/184	TI	Availability and Readiness Inspection of Severe Accident Management Guidelines (Section 4OA5.2)

## LIST OF DOCUMENTS REVIEWED

### **Section 1R01: Adverse Weather Protection**

AOP 2560, "Storms, High Winds and High Tides," Revision 010-05  
 AOP 3569, "Severe Weather Conditions," Revision 016-00  
 C OP 200.8, "Response to ISO New England/CONVEX Notifications and Alerts," Revision 004-05  
 ISO New England OP 4, "Action during a Capacity Deficiency," Revision 10  
 ISO New England M/LCC 5, "Procedure for Millstone Point Station Generation Reduction," Revision 10  
 SP 2665, "Building Flood Gate Inspections," Revision 005-02  
 System Health Report, NSST, RSST and Main Transformer, 1<sup>st</sup> Quarter 2011  
 System Health Report, 345KV Switchyard, 1<sup>st</sup> Quarter 2011  
 System Health Report, Unit 2 and Unit 3 Doors and Barriers, 1<sup>st</sup> Quarter 2011  
 M2 99 13754  
 53102268158 53102410975  
 53102355714 53102410976  
 53102410971 53102410977  
 53102410973  
 CR381899 CR412032  
 CR381901 CR412033  
 CR412022 CR412035  
 CR412023 CR412036  
 CR412024 CR420060  
 CR412026 CR420238  
 CR412028 CR420239  
 CR420495

### **Section 1R04: Equipment Alignment**

ACE 18611, "Failure of SP2609E for Facility 1 on April 3, 2011"  
 Maintenance Rule Scoping Tables for Enclosure Building Filtration  
 OP 2301B, "SDC/SFPC Core Off-Loaded," Revision 000-05  
 OP 2308-002, "HPSI System Valve Alignment, Facility 2," Revision 000-04  
 OP 2314G-001, "Enclosure Building Filtration System Alignment," Revision 012-01  
 OP 3308, "Train 'A' High Pressure Safety Injection," Revision 004-06  
 System Health Report Enclosure Building Filtration, 1<sup>st</sup> quarter 2011  
 25203-26028 Sheet 5, "Piping and Instrumentation Diagram Containment and Enclosure Building Ventilation," Revision 36  
 26203-26015 Sheet 1, "Piping & Instrumentation Diagram L.P. Safety Injection System," Revision 37  
 26203-26023 Sheet 2, "Piping & Instrumentation Diagram Spent Fuel Pool Cooling & Cleanup System," Revision 30  
 MRE010817 MRE010952  
 MRE010866 MRE011396  
 MRE010875 MRE011510  
 MRE010883 MRE013253  
 MRE010886 MRE013468

MRE013497  
MRE013505  
MRE013571

MRE013572  
MRE013653

**Section 1R05: Fire Protection**

U2-24-FPP-FHA, "Millstone Unit 2, Fire Hazards Analysis," Revision 11  
Millstone Unit 2 Firefighting Strategies, April 2002  
Brigade Drill and Assessment for Unit 2 East Cable Vault

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

Miscellaneous

Aveva, NP, Inc. Engineering Information Record, No. 51-9152116-000, "Millstone Unit 2 – 2R20  
ECT Inspection Plan  
M2-EV-11-001, Revision 0, "Millstone Unit 2 Steam Generator Integrity Degradation  
Assessment (2R20)"

Welding Package

SA-AA-123, Revision 0, "Safety Requirements for Welding, Cutting and Brazing"  
WO 53102382555, "SWLB – Modification of Service Water Spt 60469 – DM2-00, 01-0132/10  
CMP 701.01, Revision 002-04, "Pre-Job Checklist"  
SA-AA-110, Attachment 2, "Job Hazard Assessment"  
WM-AA-301, Attachment 14, "High Contingency Plan Actions"

Procedures

ER-AA-NDE-UT-701, Revision 4, "Ultrasonic Thickness Measurement Procedure"  
CM-AA-FPA-101, Revision 3, "Control of Combustible and Flammable Materials"  
ER-AA-RRM-100, Revision 2, "ASME Section XI Repair/Replacement Program Fleet  
Implementation Requirements"  
ER-AA-NDE-VT-603, Revision 3, "VT-3 Visual Examination Procedure"  
MA-AA-101, Revision 5, "Fleet Lifting and Material Handling"  
MA-AA-1001, Revision 4, "Supplemental Personnel"  
MP-VE-9, Revision 001, "Visual Weld Acceptance Criteria for Weldments and Brazed  
Joints"  
SA-AA-107, Revision 0, "Fall Protection"  
SA-AA-108, Revision 0, "Hand and Portable Power Tool Safety"  
SA-AA-111, Revision 0, "Ladder Safety"  
SA-AA-118, Revision 2, "Personal Protective Equipment"  
SA-AA-119, Revision 2, "Safety Signs and Barriers"  
SA-AA-123, Revision 0, "Welding, Cutting, and Brazing Safety"

Drawings

252003-22200, SH 60469G

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

MP2 ES11301A, "Evaluated Simulator Exam"  
LORT SE 16, Revision 4

**Section 1R12: Maintenance Effectiveness**

Apparent Cause of Failure Report, 'C' Charging Pump Motor, Electric Motor & Contracting Co., Inc.

Maintenance Rule Scoping Tables, Charging, Letdown and Boric Acid

System Health Report, Charging, Letdown and Boric Acid, 1<sup>st</sup> Quarter 2010 and 1<sup>st</sup> quarter 2011

MRE010523	MRE011217
MRE010817	MRE011377
MRE010827	MRE012159
MRE010852	MRE012314
MRE010911	MRE012382
MRE010912	MRE012902
MRE010933	MRE013587
MRE010954	MRE013664
MRE011216	MRE013670

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

Alternate Plant Configuration Sheet for shutting 2-RC-252, pressurizer spray line isolation ETE-MP-2011-0090, "Structural Integrity Evaluation for MPS3 Dealloyed Aluminum Bronze Valves," Revision 0, dated May 26, 2011

Millstone Unit 2 & Millstone Unit 3, 2R20 Switchyard Work Risk Management Plan, Revision 1, March 31, 2011

Millstone Unit 2 Shutdown Safety Assessment (SSA) Checklist April 5, 2011, April 7, 2011

Millstone Unit 2 High Risk Evolution Plan for the 1<sup>st</sup> Reduction in RCS Inventory

Millstone Unit 3 EOOS Operator's Risk Report, April 14, 2011

OP-AA-1500, "Operational Configuration Control," Revision 5

OP 2301E, "Draining the RCS (ICCE)," Revision 024-07

OU-AA-200, "Shutdown Risk Management," Revision 2

OU-M2-201, "Shutdown Safety Assessment Checklist," Revision 1

Pre-2R20 Shutdown Risk Schedule Review

Shutdown Risk Contingency Plan Replacement of 2-SW-97B – Orange

SP 3446B12, "Train 'B' Solid State Protection System Operational Test," Revision 012-04

ESI-TP-3 96000049, "345 KV System," Revision 1

CR421347

CR422907

CR422915

CR428600

CR428654

CR428658

WO 53102440496

WO 53102273422

**Section 1R15: Operability Evaluations**

AOP-3555, "Reactor Coolant System Leak," Revision 017-02

EOP-3505, "Loss of Shutdown Cooling and/or RCS Inventory," Revision 10-03

EOP-ECA-1.2, "LOCA Outside of Containment," Revision 008

RAS 000176, "Justification for TCOA to Secure RCPs," Revision 0 dated April 4, 2011

NRC Memo from John Hannon to Sunil Weerakkody, "Subject: Resolution of Questions



CR420439  
 CR421265  
 CR423437  
 CR424910

CR424939  
 CR425314  
 CR425513

**Section 1R22: Surveillance Testing**

SP 3622.3, "TDAFW Pump Operational Readiness and Quarterly IST Group 'B' Pump Tests,"  
 Revision 017-03

SP 3622.3-001, Surveillance Form Revision 014-03

SP 3556B12, "SSPS Train 'B' Operational Test," Revision 012-04

CR412930, "Chemistry procedure needs enhancement"

Millstone Nuclear Power Station Gamma Spectrum Analysis dated May 27, 2011

CP 3802E, "Reactor Coolant gas Sampling and Analysis," Revision 002-01

53102294614

53102299983

53102296198

53102300352

CR422915

CR420164

CR425958

CR422421

CR426589

CR422847

CR426592

CR422907

**Section 2RS01/2RS02/2RS03/2RS04/2RS05/2RS06: Radiological Hazard Assessment and Exposure Control, Occupational ALARA Planning and Controls, In-Plant Airborne Radioactivity Control and Mitigation, Occupational Dose Assessment, Radiation Monitoring Instrumentation, Radioactive Gaseous and Liquid Effluent Treatment**

Procedures

SP 2815, Main Station Stack WRGM Sampling for Iodine and Particulates

SP 2814A, Gaseous Effluents for Iodines and Particulates from Unit 2 Vent

SP 3878, Unit 3 Monthly Liquid and Gaseous Effluent Dose Projection

SP 2858, Offsite Dose Noble Gases from Unit 2

SP 2859, Off-Site Dose-Iodine and Particulate Releases

RP-AA-502, Groundwater Protection Program

RP-AA-504, Remediation Process for the Groundwater Protection Program

RP-AA-524, Performing Source Term Estimates and Dose Calculations for Carbon-14 Effluents

RPM 2.8.5, Sampling and Disposal of Unit 3 Waste Test Tank Berm Water

EN 21235, Millstone Unit 2 Radiation Monitor High Radiation Setpoints

EN31153, Millstone Unit 3 Radiation Monitor High Radiation Setpoints

EP-AA-303, Equipment Important to Emergency Response

CY-AA-LQC-400-1000, Confirmatory Measurements Using Blind Samples

SP 3880, Unit 3 SCLRS Vent Radiation Monitor Inoperable

Radiological Hazard Assessment (71124.01)

RPM 1.5.2, Revision 4, High Radiation Area Key Control

RPM 1.5.5, Revision 4, Guidelines for Performance of Radiological Surveys

RPM 1.5.6, Revision 3, Survey Documentation and Disposition

RPM 2.1.1, Revision 5, Issuance and Control of RWPs

RPM 2.4.1, Revision 6, Posting of Radiological Control Areas

RPM 2.5.2, Revision 2, Guidelines for Spent Fuel Pool or Flooded Reactor Cavity Work  
RPM 5.2.2, Revision 10, Basic Radiation Worker Responsibilities  
RPM-GDL-008, Revision 0, Electronic Dosimeter Alarm Set Points  
RP-AA-201, Revision 4, Access Controls for High and Very High Radiation Areas  
RP-AA-106, Revision 1, Radiological Work Control Program  
RP-AA-124, Revision 2, Dosimetry Discrepancy and ED Alarm  
RP-AA-201, Revision 5, Access Controls for High and Very High Radiation Areas  
RP-AA-203, Revision 0, Radiological Labeling and Marking  
RP-AA-222, Revision 0, Radiation Surveys  
RP-AA-223, Revision 1, Contamination Surveys

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 Reviews and Reports  
RPM 1.4.2, Revision 2, ALARA Engineering Controls  
RPM 1.4.4, Revision 2, Temporary Shielding  
RPM 2.1.2, Revision 2, ALARA Interface with the RWP Process  
RPM 5.2.3, Revision 3, ALARA Program and Policy

In-Plant Airborne Radioactivity Control and Mitigation (71124.03)

RPM 2.4.3, Revision 5, DOP Testing of Portable HEPA Filtered Ventilation and Vacuum Units  
RPM 2.10.2, Revision 11, Air Sample Counting and Analysis

Calibration/Source/Functional Testing Records Reviewed:

In-Plant Effluent Monitors

Unit 2

Containment Gaseous and Particulate Process Radiation Monitor (RM-8123)  
Aerated Liquid Rad Waste Process Radiation Monitor (RM-9116)  
Waste Gas Process Radiation Monitor (RM-9095)  
Reactor Building Closed Cooling Water Radiation Monitor (RM-6038)  
Clean Liquid Rad Waste Process Radiation Monitor (RM-9049)

Unit 3

Containment Area High Range Radiation Monitor (3RMS\*RIY05A)  
Waste Neutralization Sump Radiation Monitor (3CND-RIY07)  
Ventilation Vent Stack High Range Radiation Monitor (3HVR\*RIY10A)  
Ventilation Vent Stack Normal Range Radiation Monitor (3HVR\*RIY10B)  
Supplemental Leak Collection and Release System High Range Radiation Monitor  
(3HVR\*RIY19A)  
Liquid Waste Radiation Monitor (3LWS-RIY70)  
Turbine Building Floor Drains Radiation Monitor (3DAS-RIY50)



Air Cleaning System Testing

SP 3614A, Unit 3 Auxiliary Building Ventilation System Surveillance Tests  
SP 3614I, Unit 3 Supplemental Leak Collection and Release System Surveillance Tests  
SP 2654Q, Unit 2 Containment and Enclosure Building Exhaust Filter L-25 HEPA  
Filtration Testing  
SP 2609D, Unit 2 Enclosure Building Charcoal/HEPA Filtration Testing  
SP 3449B, SLCRS Gaseous Radiation Monitor and Ventilation Vent Stack Calibration  
VPROC-OPS03-001, In-Place Testing of HEPA Filters & Charcoal Absorbers

Other Documents

Monthly, Quarterly, and Annual Liquid and Gaseous Effluent Dose Assessments for  
Unit 2 and Unit 3 from April 2010 through April 2011  
2010 Radioactive Effluent Release Report  
MP-22-REC-BAP01, Revision 26, Radiological Effluent Monitoring and Off-Site Dose  
Calculation Manual  
Audit 09-15, Off-Site Dose Calculation Manual/Radiological Environmental Monitoring  
Program (REMODOCM)

Occupational Dose Assessment (71124.04)

RPM 1.3.8, Revision 8, Criteria for Dosimetry Issue  
RPM 1.3.12, Revision 8, Internal Monitoring Program  
RPM 1.3.13, Revision 8, Bioassay Sampling and Analysis  
RPM 1.3.14, Revision 7, Personnel Dose Calculations and Assessments  
RPM 1.6.4, Revision 3, Siemens Electronic Dosimetry System  
RPM 2.5.8, Revision 3, Stay Time Tracking and Multi-Badging for Special Work  
RP-AA-123, Revision 1, Effective Dose Equivalent  
RP-AA-150, Revision 1, TLD Performance Testing

Condition Reports

423674, 416492, 416953, 418801, 419290, 419879, 420476, 420959, 421000, 421056, 421115,  
421661, 421760, 421906, 421915, 422233, 422281, 422384, 422712, 428440, 417715, 420139,  
382107, 425848, 421522, 422894, 422553, 418694, 409791, 387731, 380555, 370396, 368894

Site ALARA Council Meeting Minutes

2R20 Planning Presentations for Operations & Local Leak Rate Testing, Decon, Shielding  
Installation & Removal, In-service Inspection, Steam Generator Corrective Maintenance (CM)  
and Preventative Maintenance (PM), Reactor Disassembly/Reassembly, Mechanical CMs &  
PMs, Instrumentation & Controls Tasks

Miscellaneous Documents

NVLAP Certification Records, Personnel Dosimetry Performance Testing  
Annual Review Report of the 2010 10 CFR Part 61 Radionuclide Analysis  
Electronic Dosimeter Dose/Dose Rate Alarm Reports, January 2011 – April 2011  
Top Ten Individual Exposure Records for 2011  
Portable HEPA Inventory & Test Records  
EPRI Standard Radiation Monitoring Program Data Summary for Unit 2 piping  
Unit 2 Reactor Coolant System 2R20 Clean Up Data  
Nuclear Oversight Field Observation 2R20 Snapshot Reports

2R20 ALARA Plans (AP)/ Work-In-Progress (WIP) Reviews

AP 2-11-01, Reactor Disassembly/Reassembly

AP 2-11-09, Steam Generator PMs & CMs

AP 2-11-13, Scaffolding Installation/Removal, Installation of Permanent Scaffolding

AP 2-11-14, Insulation Removal/Installation

AP 2-11-26, Radiation Protection Support Activities for 2R20

**Section 40A3: Event Follow-up**

ACE 18611, "2R20 Failure of SP 2609E for Facility 1 on April 3, 2011

MP 2701J-114, "Main Steam Safety Valve Discharge Piping," Revision 0

MP2702F10A, "Cleaning and Inspection of MSSVs Sliding Bushings," Revision 000

RCE000984, "Enclosure Building Filtration System (EBFS) Negative Pressure Test Failed

Acceptance Criteria

SP 2609E, "EBFS Negative Pressure Test," Revision 009-04

SP 2609EE-001, "EBFS Negative Pressure Test, Facility 1," Revision 008-03

SP 2609EE-002, "EBFS Negative Pressure Test, Facility 2," Revision 001-04

CR420485

53M20807056

53M29208468

## LIST OF ACRONYMS

AC	Alternating Current
ADAMS	Agencywide Documents Access and Management System
ALARA	As Low As Reasonably Achievable
AOP	Abnormal Operating Procedure
AP	ALARA Plans
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CEDE	Committed Effective Dose Equivalent
CFR	Code of Federal Regulations
CLB	Current Licensing Basis
CR	Condition Report
CVCS	Chemical and Volume Control System
CW	Circulating Water
DAC	Derived Air Concentration
DG	Diesel Generator
DNB	Departure from Nucleate Boiling
DNC	Dominion Nuclear Connecticut
DPW	Declared Pregnant Workers
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
ECCS	Emergency Core Cooling System
EDEX	External Effective Dose Equivalent
EDG	Emergency Diesel Generator
EBFS	Enclosure Building Filtration System
EP	Emergency Preparedness
ESAS	Engineered Safety-Feature Actuation System
ESF	Engineered Safety Feature
FSAR	Final Safety Analysis Report
HEPA	High Efficiency Particulate Air
HPSI	High Pressure Safety Injection
HRA	High Radiation Areas
ICI	Incore Instrument
I&C	Instrumentation and Control
IMC	Inspection Manual Chapter
IST	In-Service Testing
JITT	Just-in-time-training
LER	Licensee Event Reports
LHRA	Locked High Radiation Area
LPSI	Low Pressure Safety Injection
LOCA	Loss of Coolant Accident
MCC	Motor Control Center
mrem	millirem
MSSV	Main Steam Safety Valve
MWTH	Megawatts Thermal
NCV	Non-Cited Violation

NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NVLAP	National Voluntary Laboratory Accreditation Program
OD	Operability Determinations
ODCM	Off-Site Dose Calculation Manual
OOS	Out Of Service
PARS	Publicly Available Records System
PI	Performance Indicator
PI&R	Problem Identification and Resolution
PM	Preventive Maintenance
PMT	Post Maintenance Testing
RBCCW	Reactor Building Closed Cooling Water
RCA	Radiologically Controlled Area
RCE	Root Cause Evaluation
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
REMDCM	Radiological Effluent Monitoring and Offsite Dose Calculation Manual
RWP	Radiological Work Permit
SAC	Site ALARA Council
SDC	Shutdown Cooling
SDP	Significance Determination Process
SG	Steam Generator
SGFP	Steam Generator Feedwater Pump
SLCRS	Supplemental Leak Collection and Release System
SP	Surveillance Procedures
SW	Service Water
TEDE	Total Effective Dose Equivalent
TLD	Thermoluminescent Dosimeter
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
UGS	Upper Guide Structure
VHRA	Very High Radiation Areas
WO	Work Order
WRGM	Wide Range Gas Monitor

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

August 8, 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 05000336/2011404 AND 05000423/2011404

Dear Mr. Heacock:

On July 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 report documents the inspection results, which were discussed on July 1, 2011, with Mr. A. J. Jordan, Site Vice President, 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.

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 NRC's document system, 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, because of the security-related information contained in the enclosure, and in accordance with 10 CFR 2.390, a copy of this letter's enclosure will not be available for public inspection.

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

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D. Heacock

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In accordance with 10 CFR 2.390(b)(1)(ii), the NRC is waiving the affidavit requirements for your response, if any. This practice will ensure that your response will not be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system, ADAMS. If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.22. Otherwise, mark your entire response "Security-Related Information - Withhold Under 10 CFR 2.390," and follow the instructions for withholding in 10 CFR 2.390(b)(1).

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 05000336/2011404 and 05000423/2011404  
w/Attachment: Supplemental Information Official Use Only Security Related Information  
(OUO-SRI)

cc: See next page

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D. Heacock

2

In accordance with 10 CFR 2.390(b)(1)(ii), the NRC is waiving the affidavit requirements for your response, if any. This practice will ensure that your response will not be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system, ADAMS. If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.22. Otherwise, mark your entire response "Security-Related Information - Withhold Under 10 CFR 2.390," and follow the instructions for withholding in 10 CFR 2.390(b)(1).

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 05000336/2011404 and 05000423/2011404  
w/Attachment: Supplemental Information Official Use Only Security Related Information (OUO-SRI)

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SUNSI Review Complete: JMT (Reviewer's Initials)

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D. Heacock

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cc w/encl; w/OUO-SRI

P. Baumann, Security Manager, Millstone Station

E. Wilds, Jr., Ph.D., Director, State of Connecticut SLO

R. Frazier, NY State Office of Homeland Security

F. Murray, President & CEO, NY State Energy Research and Development Authority

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

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D. Heacock

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J. Clifford, DRP (R1DRPMAIL RESOURCE)

C. Miller, DRS (R1DRSMAIL RESOURCE)

P. Wilson, DRS (R1DRSMAIL RESOURCE)

J. McHale, RI OEDO

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

August 8, 2011

EA-11-047

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

**SUBJECT: 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**

Dear Mr. Heacock:

This letter provides you the final significance determination for the preliminary White finding discussed in the U.S. Nuclear Regulatory Commission (NRC) letter dated May 27, 2011, as well as our assessment of the current performance of the Dominion Nuclear Connecticut, Inc. (Dominion) Millstone Power Station (Millstone) Unit 2. This updated assessment of Millstone Unit 2 supplements, but does not supersede, our annual assessment letter issued on March 4, 2011 (ML110620174)<sup>1</sup>.

As described in the May 27, 2011 letter, the finding was identified during an NRC special inspection initiated on February 22, 2011. The finding involved 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, as well as the failure to have appropriate guidance in procedures to address multiple reactivity additions. This finding contributed to an unintended eight percent power increase during the test. The finding was presented at an exit meeting held at the conclusion of the special inspection on April 14, 2011, and is described in detail in the subject inspection report (NRC Inspection Report 05000336/2011008; ML111470484).

The May 27, 2011 letter also included an offer for Dominion to attend a regulatory conference (RC) or reply in writing to provide its position on the facts and assumptions the NRC used to arrive at the finding and its safety significance. At Dominion's request, a RC was held on July 19, 2011, at the NRC's Region I office in King of Prussia, Pennsylvania. During the RC, Dominion presented their observations on what occurred during the February 12, 2011 event, the results of their root cause assessment, and corrective actions being taken to prevent recurrence. Dominion also presented its views on the NRC's articulation of the finding and the criteria used to determine the significance of the finding (Inspection Manual Chapter (IMC) 0609, Appendix M, "Significance Determination Process Using Qualitative Criteria"), as

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<sup>1</sup> Designation in parentheses refers to an Agency-wide Documents Access and Management System (ADAMS) accession number. Documents referenced in this letter are publicly-available using the accession number in ADAMS.

documented in the NRC special inspection report. Specifically, Dominion stated that it was difficult to ascertain which of the qualitative decision-making attributes, considered in IMC 0609 Appendix M, factored most significantly into the NRC's preliminary determination that the finding was of White significance. A copy of the Dominion presentation and a list of RC attendees are included in Enclosures 2 and 3 to this letter.

The NRC used a qualitative assessment tool (IMC 0609, Appendix M) to assess the significance of this finding due to the contribution of multiple human performance failures to this event, which were not easily modeled using quantitative risk assessment methods. The Appendix M assessment involved analysis of several factors including: review of six specific attributes of the finding (such as the impact the issue had on defense-in-depth, whether there was a reduction in safety margin, and the extent of condition); and consideration of any additional applicable circumstances. The relative weight of each of these inputs was determined by NRC management review.

For the Millstone Unit 2 issue, the NRC staff concluded that a number of factors led to the increased significance of the finding, including: 1) multiple human performance errors were committed by plant operators who play a vital role in maintaining defense-in-depth; 2) the operators' actions resulted in multiple positive reactivity additions to the reactor and reduced safety margin; 3) other Millstone Unit 2 operating crews also displayed some degraded performance during the post-event assessment; 4) the performance issues with the involved operating crew and the procedural deficiencies existed for an extended period of time prior to the event; and 5) Millstone's immediate response to the event, including recognizing that it occurred and entering it into the site's corrective action program, was delayed. The NRC also concluded that other factors lessened the significance of the finding, including: 1) fission product barriers were not compromised during the event; 2) although an automatic plant trip was inappropriately prevented by operator actions, one was not actually required to prevent fuel damage; and, 3) Dominion's root cause analysis was thorough and identified corrective actions that appear to address the underlying causal factors of the event.

After considering the information developed during the inspection, the information Dominion provided during the RC, and a qualitative assessment of the factors described above, the NRC determined that the inspection finding is of low to moderate safety significance, and is therefore appropriately characterized as White. The most significant factors in making this determination were the multiple, operator-induced positive reactivity additions that contributed to the unplanned reactor power increase and the impact on defense-in-depth associated with degraded human performance, and a lack of effective communication between operating crew members, which was exhibited during this event. You have 30 calendar days from the date of this letter to appeal the staff's determination of significance for the identified White finding. Such appeals will be considered to have merit only if they meet the criteria given in the IMC 0609, Attachment 2, "Process for Appealing NRC Characterization of Inspection Findings." An appeal must be sent in writing to the Regional Administrator, Region I, 475 Allendale Rd., King of Prussia, PA 19406. You are not required to respond to this letter. However, if you choose to respond, you should follow the instructions specified in the enclosed Notice when preparing your response.

As a result of our review of Millstone Unit 2 performance, including this White finding in the Initiating Events Cornerstone, we have assessed Millstone Unit 2 to be in the Regulatory Response column of the NRC Action Matrix. Therefore, we plan to conduct a supplemental inspection using Inspection Procedure 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area," when Dominion staff notify us of their readiness for this inspection. This inspection 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 has also determined that violations of NRC regulations occurred, as cited in the enclosed Notice of Violation (Notice). The violations involve failures by Millstone Unit 2 staff to: 1) correctly implement written procedures regarding their authorities and responsibilities for safe operation and shutdown; and, 2) develop written procedures related to the reactor protection system and for power operation and transients involving multiple reactivity additions. Details of the violations are provided in the attached Notice. In accordance with the NRC Enforcement Policy, the Notice is considered an escalated enforcement action because it is associated with a White finding.

At the July 19, 2011, RC, Dominion staff described the corrective actions Dominion has taken in response to the violations. These actions include: 1) initiation of a Prompt Issue Response Team within 12 hours of the event; 2) re-creation of the event on the Millstone Unit 2 simulator; 3) establishment, within 24 hours of the event, of senior station management oversight in the Millstone Unit 2 control room resulting in over 100 individual observations conducted in over 1000 man-hours; 4) suspension of crew qualifications for remedial training and assessment; 5) performance of a root cause evaluation by a team including three non-Dominion industry personnel; and, 6) implementation of a performance management program with ongoing evaluation of operator crew performance resulting in remediation, as warranted, and reinforcement of operator accountability.

The NRC has concluded that the information regarding the reason for the violations, the corrective actions taken and planned to correct the violations and prevent recurrence, and the date when full compliance was achieved is already addressed adequately on the docket in NRC Inspection Report 05000336/2011008, the information you presented at the RC (ML112000150), and this letter. Therefore, you are not required to respond to this letter unless the description therein does not accurately reflect your corrective actions or your position.

Notwithstanding our final assessment of the finding and related violations, the NRC staff appreciates Dominion's feedback provided during the RC that the special inspection report, including the specific IMC 0609, Appendix M analysis table provided in Attachment 4 to that report, may not have succinctly communicated how the NRC preliminarily determined the finding's significance to be White. The NRC staff will consider Dominion's feedback in future communications on the bases for our significance determination of findings, particularly when they are evaluated using this qualitative assessment tool. The NRC staff recognizes that Dominion was identifying certain corrective actions in parallel with questions that were being raised by the NRC, and that these actions (such as disqualifying some, but not all, of the operating crew members) were implemented without NRC involvement. While this clarification is noteworthy, as discussed during the RC, Millstone management's response to the event (most significantly, that of the Shift Manager and other Senior Reactor Operators involved) was not a primary factor in the NRC preliminary significance determination.

D. Heacock

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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 you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room located at NRC Headquarters in Rockville, MD, 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>. To the extent possible, your response, if you choose to provide one, should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Sincerely,

A handwritten signature in black ink, appearing to read 'W M Dean', with a long horizontal flourish extending to the right.

William M. Dean  
Regional Administrator

Docket No. 50-336  
License No. DPR-65

Enclosures:

1. Notice of Violation
2. Regulatory Conference Agenda/List of Attendees (ML112000518)
3. Dominion Regulatory Conference Presentation (ML112000536)

cc w/encl: Distribution via ListServ

D. Heacock

4

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 you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room located at NRC Headquarters in Rockville, MD, 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>. To the extent possible, your response, if you choose to provide one, should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Sincerely,

/RA/

William M. Dean  
Regional Administrator

Docket No. 50-336  
License No. DPR-65

Enclosures:

1. Notice of Violation
2. Regulatory Conference Agenda/List of Attendees (ML112000518)
3. Dominion Regulatory Conference Presentation (ML112000536)

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NAME	KFarrar / KLF*	DHolody / DJH*	G Gulla via email	S Lee with comment, via email	WDean
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(C. Evans, S. Orth, H. Gepford)

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ENCLOSURE  
NOTICE OF VIOLATION

Dominion Nuclear Connecticut, Inc.  
Millstone Power Station Unit 2

Docket No. 50-336  
License No. DPR-65  
EA-2011-047

During an NRC special inspection conducted at the Dominion Nuclear Connecticut, Inc. (Dominion) Millstone Power Station (Millstone) Unit 2 between February 22, 2011, and April 14, 2011, for which an exit meeting was held on April 14, 2011, violations of NRC requirements were identified. In accordance with the NRC Enforcement Policy, the violations are listed below:

- A. Millstone Unit 2 Technical Specification 6.8, "Procedures," states, in part, that written procedures shall be implemented covering the applicable procedures recommended in Appendix 'A' of Regulatory Guide (RG) 1.33, February 1978.

RG 1.33, "Quality Assurance Program Requirements (Operation), Rev. 2, Feb. 1978, Appendix A, Paragraph 1, "Administrative Procedures," specifies safety-related activities that should be covered by written procedures, including authorities and responsibilities for safe operation and shutdown

Contrary to the above, on February 12, 2011, during the conduct of main turbine control valve testing, Millstone Unit 2 operators failed to implement written procedures regarding their authorities and responsibilities for safe operation and shutdown, and thereby caused and/or exacerbated an unanticipated eight percent reactor power increase, as evidenced by the following examples:

1. Dominion Procedure OP-AP-300, "Reactivity Management," states, in part, that the Reactor Operator (RO) will stop and question unexpected situations involving reactivity, criticality, power level, or core anomalies, and will meet the anomalous indication with conservative actions.

However, on February 12, 2011, when the Millstone Unit 2 Balance of Plant (BOP) RO encountered an unexpected situation involving reactivity and power level, the BOP RO failed to either stop or to otherwise take conservative action. Specifically, when the BOP RO placed Millstone Unit 2 turbine first stage pressure in service and noted an increase in first stage pressure, the BOP RO incorrectly pressed the turbine load set INCREASE button instead of the DECREASE button. When the BOP RO identified that first stage pressure did not decrease, the BOP RO pressed the INCREASE button three more times, and then pressed the DECREASE button twice. The actions by the BOP RO resulted in a rapid, unintended rise in Millstone Unit 2 reactor power.



2. Dominion Procedure OP-AP-300, "Reactivity Management," states, in part, that the Reactivity Senior Reactor Operator (SRO) reports to the Unit Supervisor, has no concurrent duties, directly monitors the reactivity change, and will provide peer checks for the RO for all reactivity manipulations.

However, on February 12, 2011, the Millstone Unit 2 Reactivity SRO performed a concurrent duty and did not monitor reactivity changes. Specifically, when the SM directed the Reactivity SRO to withdraw a bank of control rods by four steps, the Reactivity SRO (who had been monitoring the RCS dilution) did not identify that an unanticipated reactor power increase was already occurring. The Reactivity SRO stopped monitoring the RCS dilution and withdrew the control rods, thereby adding additional positive reactivity and exacerbated the unanticipated power increase. Additionally, as reactor power increased toward the reactor protection system (RPS) Variable High Power Trip (VHT) setpoints, the Reactivity SRO (believing reactor power was increasing due to minor power fluctuations) reset the setpoints to higher values four times, thereby preventing an automatic reactor trip. The Reactivity SRO did not recognize the reactivity change and did not inform anyone on shift at the time of his actions to reset the VHT.

3. Dominion Procedure OP-AA-100, "Conduct of Operations," in part, establishes the expectation that the Shift Manager (SM) will maintain a broad perspective of plant operations as the senior management representative on shift.

Dominion Procedure OP-AP-300, "Reactivity Management," Attachment 2, "Specific Reactivity Management Requirements," states, in part, that adding positive reactivity is never an appropriate way to address unstable plant conditions, and that it is non-conservative to withdraw control rods in an attempt to restore primary coolant temperature during a transient.

However, on February 12, 2011, the Millstone Unit 2 SM did not maintain a broad perspective of plant operations and the SM addressed unstable plant conditions by adding positive reactivity. Specifically, the SM failed to recognize that an unanticipated power increase was occurring. Upon noting that the turbine bypass valve had automatically closed (per design, in response to the power increase), the SM directed the Millstone Unit 2 Operator at the Controls (OATC) RO to re-open the valve. Additionally, upon noting that Reactor Coolant System (RCS) temperature was lowering (also due to the power increase), the SM directed the Millstone Unit 2 Reactivity SRO to withdraw a bank of control rods by four steps. These actions added positive reactivity and exacerbated the unanticipated reactor power increase.

4. Dominion Procedure OP-AP-300, "Reactivity Management," states, in part, that an RO will stop and question unexpected situations involving reactivity, criticality, power level, or core anomalies, and will meet the anomalous indication with conservative actions.

However, on February 12, 2011, the Millstone OATC RO, who was adding positive reactivity by diluting the Millstone Unit 2 reactor coolant system in preparation for the main turbine control valve test, failed to meet an unexpected situation involving

reactivity and power level with conservative action. Specifically, the OATC RO followed the direction of the SM to reopen the turbine bypass valve, thereby adding additional positive reactivity and exacerbated the unanticipated power increase.

5. Dominion Procedure OP-AA-100, "Conduct of Operations," states, in part, that the Unit Supervisor (US) will provide oversight of plant operations and ensure the plant is operated safely in accordance with procedures.

Dominion Procedure OP-AP-300, "Reactivity Management," states, in part, that the US will direct reactivity changes and ensure reactivity manipulations are made in a deliberate, carefully controlled manner.

However, on February 12, 2011, the Millstone Unit 2 US did not provide effective oversight of plant operations, and reactivity manipulations were made in a manner that was neither deliberate nor carefully controlled. Specifically, the US was focused on the conduct of main turbine control valve testing, and did not monitor and control the overall plant response to the unanticipated power increase. Additionally, the US did not question or object to the directions provided by the SM that added additional positive reactivity and exacerbated the unanticipated power increase.

6. Dominion Procedure OP-AP-300, "Reactivity Management," states, in part, that the Shift Technical Advisor (STA) will provide engineering expertise to shift operators, as required, during periods of significant reactivity changes.

However, on February 12, 2011, the Millstone Unit 2 STA was peer checking the main turbine control valve test, and did not provide engineering expertise to shift operators during the unanticipated power increase.

7. Dominion Procedure OP-AA-106, "Infrequently Conducted or Complex Evolutions," states, in part, that the Senior Operations Manager assigned to oversight of a test will ensure that the test is conducted in a manner that maximizes the margin of safety of the Unit.

However, on February 12, 2011, the licensed SRO who was assigned to the Millstone Unit 2 control room to provide operations management oversight of the main turbine control valve test failed to ensure that the test was conducted in a manner that maximized the margin of safety of the Unit. Specifically, the SRO did not identify that the multiple positive reactivity additions made during the unanticipated reactor power increase were inappropriate during the event and did not take action to prevent their occurrence.

- B. Millstone Unit 2 Technical Specification 6.8, "Procedures," states, in part, that written procedures shall be developed, covering the applicable procedures recommended in Appendix A of RG 1.33, February 1978.

Contrary to the above, as of February 12, 2011, Millstone did not have adequate procedures developed that covered the applicable procedures recommended in Appendix A of RG 1.33, February 1978, which caused and/or exacerbated an

unanticipated eight percent reactor power increase during the conduct of main turbine control valve testing on February 12, 2011, as evidenced by the following examples:

1. RG 1.33, "Quality Assurance Program Requirements (Operation), Rev. 2, Feb. 1978, Appendix A, Paragraph 3, "Procedures for Startup, Operation, and Shutdown of Safety-Related PWR Systems," specifies safety-related activities that should be covered by written procedures, including, instructions for energizing, filling, venting, draining, startup, shutdown, and changing modes of operation, as appropriate, for the Reactor Control and Protection System.

However, on February 12, 2011, Millstone Unit 2 had no procedural guidance that prohibited resetting the VHT setpoint under any unexpected transient conditions. As a result, during the unanticipated reactor power transient, as reactor power increased toward the RPS VHT setpoints, the Reactivity SRO (believing reactor power was increasing due to minor power fluctuations) reset the setpoints to higher values four times, thereby preventing an automatic reactor trip.

2. RG 1.33, "Quality Assurance Program Requirements (Operation), Rev. 2, Feb. 1978, Appendix A, Paragraph 6, "Procedures for Combating Emergencies and Other Significant Events," specifies safety-related activities that should be covered by written procedures, including other expected transients that may be applicable.

However, on February 12, 2011, Millstone Unit 2 did not have a procedure for responding to multiple, concurrent, positive reactivity additions during power operations. Specifically, during the unplanned reactor power increase, Millstone Unit 2 operators implemented three additional positive reactivity additions (RCS dilution, re-opening a turbine bypass valve, and withdrawing control rods), and there was no procedural guidance regarding the concurrent execution of these activities.

These two violations are associated with a White SDP finding.

The NRC has concluded that information regarding the reason for the violations, the corrective actions taken and planned, and the date when full compliance was achieved is 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 (ML112000150). Therefore, Dominion is not required to respond to this Notice of Violation (Notice). However, Dominion is required to submit a written statement or explanation pursuant to 10 CFR 2.201 if the description therein does not accurately reflect Dominion's corrective actions or its position. In that case, or if Dominion chooses to respond, clearly mark the response as a "Reply to a Notice of Violation; EA-2011-047," and send the response to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region I, 475 Allendale Rd., King of Prussia, PA 19406, and a copy to the NRC Resident Inspector at Millstone Power Station, within 30 days of the date of the letter transmitting this Notice.

If Dominion contests this enforcement action, Dominion should also provide a copy of its response, with the basis for its denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

If Dominion chooses to respond, its response will be made available electronically for public inspection in the NRC Public Document Room or 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>. Therefore, to the extent possible, the response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

In accordance with 10 CFR 19.11, Dominion may be required to post this Notice within two working days of receipt.

Dated this 8th day of August, 2011

**NRC REGULATORY CONFERENCE  
Millstone Nuclear Power Station**

July 19, 2011, 1:00 PM  
NRC Region I, Public Meeting Room

**AGENDA**

**REGULATORY CONFERENCE**

- |   |                                      |
|---|--------------------------------------|
| I. Opening Remarks & Attendee Introductions         | W. Dean, NRC                         |
| II. Discussion of Regulatory Process                | M. McLaughlin, NRC                   |
| III. Finding Details and Significance Determination | S. Hansell, NRC                      |
| IV. Dominion Provides Additional Information        | Dominion Representatives             |
| V. NRC Questions and Dialogue                       | Dominion Representatives & NRC Staff |
| VI. Caucus (Non-Public)                             | NRC Staff                            |
| VII. Closing Remarks                                | W. Dean; Dominion Representatives    |

**PUBLIC QUESTIONS TO THE NRC**

**ATTENDEES**

NRC Staff: W. Dean, Region I (RI) Administrator  
C. Miller, Director, Division of Reactor Safety (DRS), RI  
D. Roberts, Director, Division of Reactor Projects (DRP), RI  
S. Hansell, Chief, Operations Branch, DRS, RI  
J. Circle, Acting Chief, PRA Operational Support Branch, Office of Nuclear  
Reactor Regulation (NRR)  
C. Cahill, Senior Reactor Analyst, DRS  
M. McLaughlin, Senior Enforcement Specialist, RI

Dominion  
Representatives: A.J. Jordan, Millstone Site Vice President  
J. Semancik, Millstone Plant Manager  
K. Grover, Millstone Operations Manager  
B. McCollum, Millstone Unit Supervisor  
R. MacManus, Millstone Director Nuclear Station Safety and Licensing  
L. Armstrong, Millstone Training Manager  
B. Willkens, Millstone Nuclear Specialist  
W. Bartron, Millstone Licensing Supervisor



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# Millstone Power Station

## NRC Region I Regulatory Conference

July 19, 2011

Safe – Reliable – World Class Operation



# Millstone Power Station

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Skip Jordan, Site Vice President

Jeff Semancik, Plant Manager

Ken Grover, Operations Manager

Bill McCollum, Unit Supervisor

Safe – Reliable – World Class Operation



# Conservative Operation

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- Nuclear safety is our first priority.
- We take our obligation to protect the health and safety of the public very seriously through safe, conservative plant operation.
- For this test, we specifically reduced power to less than 90%.

Safe – Reliable – World Class Operation





# Design Parameters Maintained

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- Reactor power remained less than 97%.
- Plant equipment functioned as expected and designed.
- Maintained plant and fuel design limits within margin.

Safe – Reliable – World Class Operation



# Learning Organization

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- Crew performance during this event did not meet our standards.
- We identified gaps in performance and implemented corrective actions.
- We shared insights and lessons learned with the industry.

Safe – Reliable – World Class Operation



**Dominion®**



# **Timely & Appropriate Response**

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- Initiated a Prompt Issue Response Team.
- Re-created the event on the simulator.
- Established senior station management oversight in the control room.
- Suspended crew qualifications.
- Established a root cause evaluation team.

Safe – Reliable – World Class Operation



**Dominion®**



# Root Cause/Corrective Actions

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- **Root Cause:**  
The crew performance management program was ineffective in correcting observed performance deficiencies.
- **Corrective Actions to Prevent Recurrence:**  
Added rigor to the performance management program.

Safe – Reliable – World Class Operation



# Improving Crew Performance

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Added rigor to the performance management program, including:

- Evaluation and mapping of crew performance.
- Remediation based on individual performance.
- Reinforcement of license holders' ownership and accountability for crew performance.

Safe – Reliable – World Class Operation



# Nuclear Safety - Top Priority

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- We are committed to safe, conservative operation of Millstone Station.
- Performance during the event did not meet our standards and expectations.
- Response to the event was timely and thorough; we investigated what occurred and acted decisively on the facts.

Safe – Reliable – World Class Operation



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

August 10, 2011

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

**SUBJECT: NRC INSPECTION REPORT NOS. 05000254/2011007, DOMINION  
RESOURCES, DOMINION NUCLEAR CONNECTICUT, MILLSTONE POWER  
STATION (UNIT 1), WATERFORD, CONNECTICUT**

Dear Mr. Heacock:

On August 10, 2011, the NRC issued inspection report, No. 05000254/2011007, documenting an NRC inspection of an examination of your licensed activities as they relate to radiation safety and to compliance with the Commission's regulations and the license conditions.

After the report was issued, an incorrect exit meeting date was noted in the body of the report. We have corrected this page and have enclosed the corrected copy to this letter. Please replace this page of the report with the enclosed page.

D. Heacock

We apologize for any inconvenience or problems this error may have caused you.

Sincerely,

A handwritten signature in black ink, appearing to read "J. Joustra", followed by the word "for" written in a smaller, cursive script.

Judith A. Joustra, Chief  
Decommissioning Branch  
Division of Nuclear Materials Safety

Enclosure:  
As stated.

Distribution via ListServ

cc:  
State of Connecticut



We apologize for any inconvenience or problems this error may have caused you.

Sincerely,

**/RA by Stephen Hammann For/**

Judith A. Joustra, Chief  
Decommissioning Branch  
Division of Nuclear Materials Safety

Enclosure:  
As stated.

Distribution via ListServ

CC:  
State of Connecticut

Distribution w/encl: (via email)  
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D. Lew, DRA (R1ORAMAIL RESOURCE)  
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D. Screnci, PAO  
N. McNamara, SLO  
D. Tiff, SLO  
R. Lorson, DNMS  
D. Collins, DNMS  
D. Jackson, DRP  
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D. Dodson, DRP  
S. Shaffer, DRP, SRI  
B. Haagensen, RI  
J. Krafty, DRP, RI  
C. Kowalyszyn, OA  
D. Bearde, DRS  
J. Joustra, DNMS  
L. Kauffman, DNMS  
M. Roberts, DNMS  
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DATE	08/10/2011		08/10/2011				

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## 9.0 Solid Radioactive Waste Management and Transportation Programs

### a. Inspection Scope (IP 86750)

The inspector evaluated the radioactive waste management and transportation programs to determine whether the licensee properly processed, packaged, stored, and shipped radioactive materials. The inspector reviewed the waste stream analysis for dry active waste required by 10 CFR 61.

### b. Observations and Findings

The licensee manages an asset recovery program to remove systems and/or components that are no longer needed for the safe operation of the SFP. The licensee removed and disposed three U1 feed pump motors (2M-10A, B, & C) and accessories in March 2010. The motors and accessories were classified as low specific activity (LSA) material. The radioactive waste shipment records included copies of characterization reports and waste manifest shipping papers and were complete. The licensee met the applicable radioactive waste and transportation requirements for the shipments reviewed.

### c. Conclusions

The licensee effectively implemented the radioactive waste management and transportation programs. No safety concerns or violations were identified.

## Exit Meeting Summary

On July 13, 2011, the inspector presented the preliminary inspection results to Jeffrey Semancik, Millstone Plant Manager, and members of his staff. The inspector confirmed that proprietary information was not provided or examined during the inspection.

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

INSPECTION REPORT

Inspection No. 05000245/2011007  
Docket No. 05000245  
License No. DPR-21  
Licensee: Dominion Nuclear Connecticut, Inc.  
Location: Millstone Power Station, Unit 1  
Rope Ferry Road, Waterford, CT 06385  
  
Inspection Dates: July 11 - 13, 2011  
  
Inspector: Laurie A. Kauffman  
Health Physicist  
Decommissioning Branch  
Division of Nuclear Materials Safety  
  
Approved By: Judith A. Joustra, Chief  
Decommissioning Branch  
Division of Nuclear Materials Safety

## EXECUTIVE SUMMARY

Dominion Nuclear Connecticut, Inc.  
Millstone Power Station Unit 1  
NRC Inspection Report No. 05000245/2011007

A routine announced safety inspection was conducted from July 11-13, 2011, at the Millstone Power Station Unit 1 (U1) by a region-based inspector. 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." The inspector reviewed the licensee's programs associated with U1, including the Spent Fuel Pool Island (SFPI), while in SAFSTOR status. There are no ongoing decommissioning activities being conducted at Millstone U1. Within the scope of this inspection, no safety concerns or violations were identified. The conclusions from each inspection area are presented below.

### **Organization and Management Controls Program**

The roles and responsibilities for the operation, maintenance, and control of U1 SAFSTOR program, required in Technical Specifications (TS) and the Defueled Safety Analysis Report (DSAR), were adequate to support U1 activities.

### **Design Changes and Modifications Program**

The design change program was adequate to ensure systems and components, important for maintaining the safe storage of spent fuel, were operable and reliable. The licensee implemented the plant modification packages in accordance with the regulations in 10 CFR 50.59 and the requirements of the TS and the DSAR.

### **Corrective Action Program**

The licensee's corrective action program (CAP) for identifying, resolving, and preventing conditions that could degrade safety or the quality of decommissioning activities was adequate. The threshold for identifying concerns and the priority for addressing condition reports (CRs) and implementing corrective actions were adequate and based upon safety significance.

### **Spent Fuel Pool Safety Program**

The licensee effectively implemented the SFPI program to ensure that systems and components important for maintaining the safe storage of spent fuel were operable and reliable.

### **Maintenance and Surveillance Program**

The licensee implemented a preventive maintenance and surveillance program to ensure systems and components important to maintaining the safe storage of spent fuel were operable and reliable. Established controls and measures to plan, schedule, and perform work activities were adequate.

### **Occupational Radiation Exposure Program**

The licensee radiation protection controls were adequate to limit exposures of workers to external sources of radiation. Posting and labeling of radioactive materials and radiation areas met regulatory requirements. Radiological controls and dose estimates associated with U1 tasks were effective to achieve dose goals.

### **Radiological Effluent Control and Radioactive Environmental Monitoring Programs**

The licensee maintained adequate radioactive effluent control and radiological environmental monitoring programs in accordance with regulatory requirements.

### **Solid Radioactive Waste Management and Transportation Programs**

The licensee effectively implemented the radioactive waste management and transportation programs.

## REPORT DETAILS

### **1.0 Background**

The Millstone site is located in the town of Waterford, Connecticut. Millstone U1 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 stored in the spent fuel pool.

### **2.0 Organization and Management Controls Program**

#### a. Inspection Scope (Inspection Procedure (IP) 36801)

The inspector discussed the roles and responsibilities for the operation, maintenance, and control of the SAFSTOR program, required in TS 5.1 through 5.4 and described in the DSAR. The inspector also evaluated the reduction in force (RIF) to determine the effect on the staff's overall ability to implement the SAFSTOR program.

#### b. Observations and Findings

The inspector verified that TS 5.1 through 5.4 were implemented, and that the DSAR and associated procedures were consistent with the TS requirements. During the previous inspection, the licensee underwent a RIF between March 1, 2010 and June 1, 2010. During this inspection, the inspector discussed the challenges encountered with the staff and noted the SAFSTOR activities, including the safe operation of the Spent Fuel Pool (SFP) and its associated equipment were maintained. The inspector noted that the U1 staff continued to obtain assistance from Millstone plant personnel to complete surveillance procedures and tasks required by U1 TS and procedures. No adverse trends or safety concerns were identified.

#### c. Conclusions

The roles and responsibilities for the operation, maintenance, and control of U1 SAFSTOR program, required in TS and the DSAR, were adequate to support U1 activities. No safety concerns or violations were identified.

### **3.0 Design Changes and Modifications Program**

#### a. Inspection Scope (IP 37801)

The inspector reviewed the procedures describing the design change program and the documentation for two U1 plant modifications related to the Main Exhaust Fan HVE-1A Motor and the Waste Water Processing System. The inspector reviewed the design change packages against the regulations in 10 CFR 50.59 and the requirements of the TS and the DSAR to determine if the licensee ensured that systems and components important for maintaining the safe storage of spent fuel were operable and reliable. Specifically, the inspector reviewed the submitted design change packages to verify if the licensee had appropriately determined whether the design changes required: a 10 CFR 50.59 safety evaluation; license or TS amendment; and/or a DSAR update.

b. Observations and Findings

The inspector reviewed the plant modification packages and verified they included a Design Change Request and a Design Change Notice (DCN). The DCN process was used to describe the systems or components to be changed, propose solutions, and to justify changes. The DCN was used to determine whether a 10 CFR 50.59 safety evaluation, a license or TS amendment, and/or a DSAR update were required for both design changes. In particular, the licensee determined that only the Waste Water Processing System required a DSAR update. The licensee drafted changes to the DSAR Section 4, as applicable, to allow the release of the reactor building sump water through the Emergency Service Water discharge piping and through the discharge canal. The draft changes are under review by the licensing department. No adverse trends or safety concerns were identified.

c. Conclusions

The design change program was adequate to ensure systems and components, important for maintaining the safe storage of spent fuel, were operable and reliable. The licensee implemented the plant modification packages in accordance with the regulations in 10 CFR 50.59 and the requirements of the TS and the DSAR. No safety concerns or violations were identified.

**4.0 Corrective Action Program**

a. Inspection Scope (IP 40801)

The inspector reviewed the corrective action program (CAP) for identifying, resolving, and preventing conditions that could degrade safety or the quality of decommissioning activities. The inspector reviewed the procedures describing the CAP and reviewed several selected CRs.

b. Observations and Findings

The license initiated CRs in accordance with the site CAP to identify and resolve conditions that may impact SAFSTOR activities. The inspector reviewed two self-identified concerns that were documented in CRs. The concerns were related to a ventilation fan and a SFP Gate Leakage Alarm. The license investigated and corrected both concerns.

The inspector reviewed a CR that the licensee issued during a special NRC inspection pursuant to Temporary Instruction (TI2515/183) relating to the March 2011 Fukushima Daiichi Nuclear Station fuel damage event. [For details of the TI2515/183 inspection, refer to ADAMS Accession Number ML111320660.] As a result of the TI2515/183 inspection, the inspector identified an enhancement associated with the position of the U1 SFP crane. Specifically, the crane was over the center of the pool rather than at one end. During this inspection, the inspector observed the U1 crane operator reposition the SFP crane to one end of the SFP. No adverse trends or safety concerns were identified.

c. Conclusions

The licensee's CAP for identifying, resolving, and preventing conditions that could degrade safety or the quality of decommissioning activities was adequate. The threshold for identifying concerns and the priority for addressing CRs and implementing corrective actions were adequate and based upon safety significance. No safety concerns or violations were identified.

**5.0 Spent Fuel Pool Safety Program**

a. Inspection Scope (IP 60801)

The inspector evaluated the licensee's program for ensuring the safe storage of spent fuel in the SFP. The inspector reviewed and compared the DSAR, TS, and Technical Requirements Manual (TRM) with associated procedures to ascertain that they were consistent with the SFPI requirements.

The inspector performed a tour of the reactor building to evaluate the general condition of the building, systems, and components including: SFP cooling and ventilation system; decay heat removal (DHR) pumps and motors; emergency diesel generator (EDG); the east corner room; and the torus room. The inspector performed a tour of the radioactive waste facility to evaluate the general material condition of the facility and equipment including the facility sump. The inspector discussed with the licensee the spent fuel rack test that was performed in June 2011.

b. Observations and Findings

The inspector toured the facility and verified that systems and components important to the safe storage of spent fuel were operable and adequately maintained. The inspector observed several leak detection stations and noted no obvious SFP leakage. The inspector noted that the SFP temperature and water level, the SFP cooling rates, and the DHR system flow rates were monitored in accordance with the TS, TRM, and established procedures. The inspector determined that plant personnel conducted the routine system operational checks at the required frequencies. No adverse trends or safety concerns were identified.

One area not evaluated by the inspector was the spent fuel rack test (also called the Boron-10 (B-10) Areal Density Gauge for Evaluating Racks (BADGER) test) in June 2011. The results of the BADGER test were not available at the time of this inspection. The inspector will review the final test results during a subsequent inspection.

c. Conclusions

The licensee effectively implemented the SFPI program to ensure that systems and components important for maintaining the safe storage of spent fuel were operable and reliable. No safety concerns or violations were identified.

## **6.0 Maintenance and Surveillance Program**

### **a. Inspection Scope (IP 62801)**

The inspector reviewed the licensee's preventive maintenance and surveillance program including the planned and completed maintenance and surveillance activities of systems and components important for maintaining the safe storage of spent fuel. The inspector reviewed selected 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 to verify that work was being performed within the established frequencies and that the equipment was being properly maintained. The inspector also reviewed the annual reactor building bridge and hoist inspection, and the refuel platform load switch calibration procedures.

### **b. Observations and Findings**

The maintenance and surveillance test results for the SFP cooling pumps and motors; the DHR pumps, fans, and motors; the ventilation fans and motors; the EDG; the reactor building bridge and hoist; and the refuel platform load switch were thorough, performed within the established frequencies, and met the acceptance criteria defined in the associated procedures. The inspector determined that the systems and components were operable and available for service.

### **c. Conclusions**

The licensee implemented a preventive maintenance and surveillance program to ensure systems and components important to maintaining the safe storage of spent fuel were operable and reliable. Established controls and measures to plan, schedule, and perform work activities were adequate. No safety concerns or violations were identified.

## **7.0 Occupational Radiation Exposure Program**

### **a. Inspection Scope (IP 83750)**

The inspector reviewed implementation of the occupational exposure control program associated with SAFSTOR and SFPI activities. The inspection consisted of interviews with responsible individuals, reviews of documents and postings; and observations of a radiation protection technician conduct routine surveys in the reactor building.

### **b. Observations and Findings**

The inspector conducted a plant tour and determined that radiological postings were readily visible, well maintained, and reflected radiological conditions. The survey maps and related information maintained at the U1 access point were current. The high radiation areas and the TS locked high radiation areas were properly posted and locked as required.

The inspector reviewed the 2010 and 2011 year-to-date exposure reports, the 2011 as low as reasonably achievable (ALARA) evaluation for the SFP BADGER test, and the associated radiation work permits. The dose totals for 2010 and 2011 year-to-date dose reports were 0.142 mrem and 0.154 mrem, respectively. The largest contribution of the



2011 dose was due to the SFP BADGER testing and SFPI instrument calibrations. The inspector noted that the associated radiation work permits were commensurate with the radiological significance of the task and included the appropriate exposure control measures for the safe implementation of the activity. The inspector determined the licensee provided adequate exposure controls to limit the exposure of workers to external sources of radiation and used established methods to track and trend radiation dose.

c. Conclusions

The licensee radiation protection controls were adequate to limit exposures of workers to external sources of radiation. Posting and labeling of radioactive materials and radiation areas met regulatory requirements. Radiological controls and dose estimates associated with U1 tasks were effective to achieve dose goals. No safety concerns or violations were identified.

**8.0 Radiological Effluent Control and Radioactive Environmental Monitoring Programs**

a. Inspection Scope (IP 84750)

The inspector reviewed the radioactive effluent control and the radiological environmental monitoring programs associated with SAFSTOR and SFPI activities.

b. Observations and Findings

The inspector reviewed the annual radiological environmental operating report and the annual radioactive effluent release report and determined that the reports were submitted to the NRC in accordance with TS 5.7.2 and TS 5.7.3, respectively. The calculated doses were below the regulatory dose criteria of 10 CFR 50, Appendix I. The effluent and radiological environmental monitoring programs were implemented in accordance with TS requirements.

During the previous inspection, the inspector identified significant rainwater in-leakage into the radioactive waste building. The inspector reviewed the renovations to the building since the last inspection, which included repairing cracks in the walls and ceilings. The licensee is completing a new waste water processing system to manage liquid effluent from the waste building. The inspector determined that there had been no rainwater in-leakage since the previous inspection.

c. Conclusions

The licensee maintained adequate radioactive effluent control and radiological environmental monitoring programs in accordance with regulatory requirements. No safety concerns or violations were identified.

## 9.0 Solid Radioactive Waste Management and Transportation Programs

### a. Inspection Scope (IP 86750)

The inspector evaluated the radioactive waste management and transportation programs to determine whether the licensee properly processed, packaged, stored, and shipped radioactive materials. The inspector reviewed the waste stream analysis for dry active waste required by 10 CFR 61.

### b. Observations and Findings

The licensee manages an asset recovery program to remove systems and/or components that are no longer needed for the safe operation of the SFP. The licensee removed and disposed three U1 feed pump motors (2M-10A, B, & C) and accessories in March 2010. The motors and accessories were classified as low specific activity (LSA) material. The radioactive waste shipment records included copies of characterization reports and waste manifest shipping papers and were complete. The licensee met the applicable radioactive waste and transportation requirements for the shipments reviewed.

### c. Conclusions

The licensee effectively implemented the radioactive waste management and transportation programs. No safety concerns or violations were identified.

## Exit Meeting Summary

On July 13, 2011, the inspector presented the preliminary inspection results to Jeffrey Semancik, Millstone Plant Manager, and members of his staff. The inspector confirmed that proprietary information was not provided or examined during the inspection.

## PARTIAL LIST OF PERSONS CONTACTED

### Licensee

W. Bartron	Licensing Supervisor
D. Delcore	Nuclear Oversight Specialist
J. Drzewianowski	Radiation Protection Technician
A. Elms	Organizational Effectiveness Manager
S. Heard	Site Services Manager
E. Palmieri	Nuclear Maintenance Supervisor
L. Salyards	Licensing Engineer
J. Semancik	Plant Manager
G. Sturgeon	Operations Nuclear Specialist

## INSPECTION PROCEDURES USED

36801	Organization, Management, and Cost Controls at Permanently Shutdown Reactors (PSRs)
37801	Safety Reviews, Design Changes, and Modification at PSRs
40801	Self Assessment and Corrective Action
60801	Spent Fuel Pool Safety at PSRs
62801	Maintenance and Surveillance at PSRs
71801	Decommissioning Performance and Status Reviews at PSRs
83750	Occupational Radiation Exposure
84750	Radioactive Waste Treatment and Effluent and Environmental Monitoring
86750	Solid Radioactive Waste Management and Transportation

## ITEMS OPEN, CLOSED, AND DISCUSSED

None

## LIST OF DOCUMENTS REVIEWED

Millstone U1 Radiation Surveys conducted between April 2010 and July 2011  
Millstone U1 Radiation Exposure (ALARA) Reports for 2010, and most current for 2011  
Millstone U1 Surveillance Form for Operator Logs and Inspections (U1 rounds)  
Work Order 53102390415 associated with the quarterly run  
Work Order 53102281885 associated with the annual inspection of the diesel generator  
Asset Recovery Information conducted between March 2010 and June 2011  
Summary of Millstone U1 Condition Reports between March 2010 and June 2011  
CR 368109 "Unit 1 Reactor Building Crane will Not Raise or Lower"  
CR 405562, "MP1 Balance of Plant (BOP) Ventilation Exhaust Fan Failure"  
CR 422447, "Control of Unit 1 Refuel Platform Position in Spent Fuel Pool Needs Enhancement"  
CR 428247, "Unit 1 Spent Fuel Pool Gate Leakage Alarm no Functioning as Designed"

## LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
BADGER	Boron-10 (B-10) Areal Density Gauge for Evaluating Racks test
CAP	corrective action program
CFR	Code of Federal Regulations
CR	condition report
DCN	Design Change Notice
DSAR	defueled safety analysis report
IMC	inspection manual chapter
mrem	millirem
NRC	Nuclear Regulatory Commission
PARS	Publicly Available Records System
PSRs	Permanently Shutdown Reactors
SFP	spent fuel pool
SFPI	spent fuel pool island
TRM	technical requirements manual
TS	technical specification
U1	Unit 1



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

August 22, 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. 1, 2, AND 3 – ENVIRONMENTAL  
ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT (TAC NOS.  
ME5674, ME5675, AND ME5676)

Dear Mr. Heacock:

Enclosed is a copy of the Environmental Assessment and Finding of No Significant Impact related to your application for exemption dated February 10, 2011, as supplemented on March 10, 2011. The proposed action would provide exemption from the work hour control requirements of Title 10 of the *Code of Federal Regulations*, Part 26, Section 26.205(c) and (d) during declarations of severe weather conditions involving tropical storm or hurricane force winds.

The assessment is being forwarded to the Office of the Federal Register for publication.

Sincerely,

A handwritten signature in black ink, appearing to read "Carleen J. Sanders".

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:  
Environmental Assessment

cc w/encl: Distribution via Listserv

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOMINION NUCLEAR CONNECTICUT, INC.

DOCKET NOS. 50-245, 50-336, AND 50-423

MILLSTONE POWER STATION, UNIT NOS. 1, 2, AND 3

ENVIRONMENTAL ASSESSMENT AND FINDING OF

NO SIGNIFICANT IMPACT

The U.S. Nuclear Regulatory Commission (NRC) is considering issuance of an exemption from Title 10 of the *Code of Federal Regulations* (10 CFR) Part 26, "Fitness for Duty Programs," for Facility Operating License Nos. DPR-21, DPR-65, and NPF-49, issued to Dominion Nuclear Connecticut, Inc. (the licensee), for operation of the Millstone Power Station Unit Nos. 1, 2, and 3, located in New London County, Connecticut. 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:

The proposed action would provide exemption from the work hour control requirements of 10 CFR 26.205(c) and (d) during declarations of severe weather conditions involving tropical storm or hurricane force winds.

The proposed action is in accordance with the licensee's application dated February 10, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML110450583), as supplemented by letter dated March 10, 2011 (ADAMS Accession No. ML110740442).

The Need for the Proposed Action:

The proposed action extends the exception provided by 10 CFR 26.207(d) to include pre-defined entry and exit conditions related to hurricane events because the sequestering of plant personnel and related staff resource limitations may occur at times prior to and following the current entry and exit conditions (i.e., emergency declaration) specified in 10 CFR 26.207(d). Entry into a severe weather situation involving tropical storm or hurricane force winds can impose conditions similar to entry into the site emergency plan where the imposition of work hour controls on vital personnel could impede the ability to focus on plant safety and security, and may be detrimental to the health and safety of the public.

Environmental Impacts of the Proposed Action:

The NRC has completed its environmental assessment of the proposed action and concludes that extending the exception provided by 10 CFR 26.207(d) to include pre-defined entry and exit conditions related to hurricane events would not significantly affect plant safety, as it does not change the Technical Specification-required shift staffing. Additionally, the time from entry into the condition in which the work hour control exemption applies, to exiting the condition, is limited to severe weather situations involving tropical storm or hurricane force winds. The licensee states that the Hurricane Response Plan (Nuclear) and other plant-specific procedures ensure that adequate resources and guidance are in place to prepare for, respond to, and recover from severe weather conditions associated with tropical storm or hurricane force winds.

The proposed action will not significantly increase the probability or consequences of accidents. The proposed action would not result in an increased radiological hazard beyond those previously analyzed in the Final Safety Analysis Report. No changes are being made in the types of effluents that may be released offsite. There is no significant increase in the

amount of any effluent released offsite. There is no significant increase in occupational or public radiation exposure. No changes will be made to plant buildings or site property. Therefore, there are no significant radiological environmental impacts associated with the proposed action.

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 permits are needed. No effects on the aquatic or terrestrial habitat in the vicinity of the plant, or to threatened, endangered, or protected species under the Endangered Species Act, or impacts to fish habitat covered by the Magnuson-Stevens Act are expected. There are no impacts to the air or ambient air quality. There are no impacts to historical or cultural resources. There would be no noticeable effect on socioeconomic conditions in the region. Therefore, no changes or different types of non-radiological environmental impacts are expected as a result of the proposed action.

Accordingly, the NRC concludes that there are no significant environmental impacts associated with the proposed action.

Environmental Impacts of the Alternatives to the Proposed Action:

As an alternative to the proposed action, the staff considered denial of the proposed action (i.e., the "no-action" alternative). Denial of the application would result in no change in current environmental impacts. Other alternatives to the proposed action include entry and exit conditions, other than those proposed by the licensee, which would change the duration in which the exemption is effective. The staff concludes that these alternatives would not have a significant impact. The environmental impacts of the proposed action and the alternative actions 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," the NRC's 1984 "Final Environmental Statement related to operation of Millstone Nuclear Power Station, Unit No. 3," and NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," Supplement 22 regarding Millstone Power Station, Units 2 and 3.

Agencies and Persons Consulted:

In accordance with its stated policy, on May 13, 2011, the staff consulted with the Connecticut State official, Michael Firsick of the Department of Environmental Protection, regarding the environmental impact of the proposed action. The State official had no comments.

FINDING OF NO SIGNIFICANT IMPACT

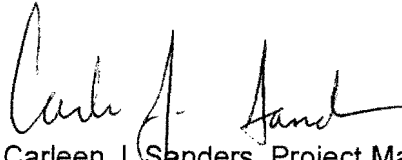
On the basis of the environmental assessment, the NRC concludes that the proposed action will not have a significant effect on the quality of the human environment. Accordingly, the NRC has determined not to prepare an environmental impact statement for the proposed action.

For further details with respect to the proposed action, see the licensee's letter dated February 10, 2011, as supplemented by letter dated March 10, 2011. 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 in Agencywide Documents Access and Management System (ADAMS) are available online 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](mailto:pdr.resource@nrc.gov).

Dated at Rockville, Maryland, this 22nd day of August 2011.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink, appearing to read "Carleen J. Sanders". The signature is written in a cursive style with a large initial "C".

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

August 22, 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. 1, 2, AND 3 – ENVIRONMENTAL  
ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT (TAC NOS.  
ME5674, ME5675, AND ME5676)

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The assessment 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 Nos. 50-245, 50-336, and 50-423

Enclosure:  
Environmental Assessment

cc w/encl: Distribution via Listserv

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DATE	06/02/11	08/ 11 /11	08/ 09 /11	06/02/11 08/15/11	06/23/11	08/03/11
OFFICE	DORL/LPL1-2/BC	DORL/LPL1-2/PM				
NAME	HChernoff (REnnis for)	CSanders				
DATE	08 / 22 /11	08 / 22 /11				

OFFICIAL RECORD COPY

**NUCLEAR ENERGY ADVISORY COUNCIL  
7:00 PM  
SEPTEMBER 22, 2011  
EAST LYME SENIOR CENTER  
37 SOCIETY ROAD  
NIANTIC, CT  
REGULAR MEETING**

**MINUTES**

**Members Present**

Mr. Bill Sheehan, Chair  
Ms. Pearl Rathbun, Vice Chair  
Mr. Robert Klancko  
Mr. Denny Hicks  
Mr. James Sherrard  
Dr. Edward Wilds representing Commissioner Esty  
Absent:  
Mr. John Markowicz  
Ms. Marjorie DeBold  
Mr. Tom Nebel  
Dr. Gregg Dixon  
Representative Kevin Ryan

**1. Call to Order**

NEAC Chair Sheehan called the meeting to order at 7:07 PM at East Lyme Senior Center in East Lyme, Connecticut.

**2. Approval of Minutes of August 24, 2011 NEAC meeting**

Motion by Mr. Sherrard/Mr. Klancko to Approve minutes. Minutes approved with Mr. Hicks and Dr Wilds abstaining.

**3. PROGRAM:**

**a) Briefing on Current Operations and Plans for Millstone Power Station by Dominion Nuclear Connecticut Representatives**

See attached power point presentation by Dominion Site Vice President Skip Jordan and Dominion Government Affairs Director Kevin Hennessy. In response to NEAC questions, Mr. Jordan noted that there were only seven outstanding employee concerns submitted in the past year.

**4. Public Comment**

No Public Comment

**5. NRC Correspondence Received since past meeting.**

There were no questions from members regarding the correspondence received since the last meeting.

**6. New Business**

There was no new business.

**7. Next Meeting Date and Time**

The next regular meeting will be 7:00 PM Thursday December 8, 2011 for annual report preparation.

**8. Adjournment**

Motion to adjourn passed unanimously and Meeting adjourned at 7:57 PM



**Dominion<sup>®</sup>**



## **Millstone Presentation to NEAC**

September 22, 2011

# Agenda

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- **Current Plant Status**
- **Safety at Millstone**
- **Millstone Outages**
- **Natural Disaster Preparation and Response**
- **Millstone Demographics**
- **Taxation and Millstone**
- **Visitors**

# Current Plant Status

Current Plant Status (9/22/2011)	Unit 2	Unit 3
Power Level	100	100
Days On-Line	4	401
Days Since Any Trip from Power	94	493
Unit MW	856	1218
YTD Capacity Factor (8/31/2011)	85.0	100.5
Threats to Generation	None	None



# INPO Index

## 2015 Performance Indicator Index

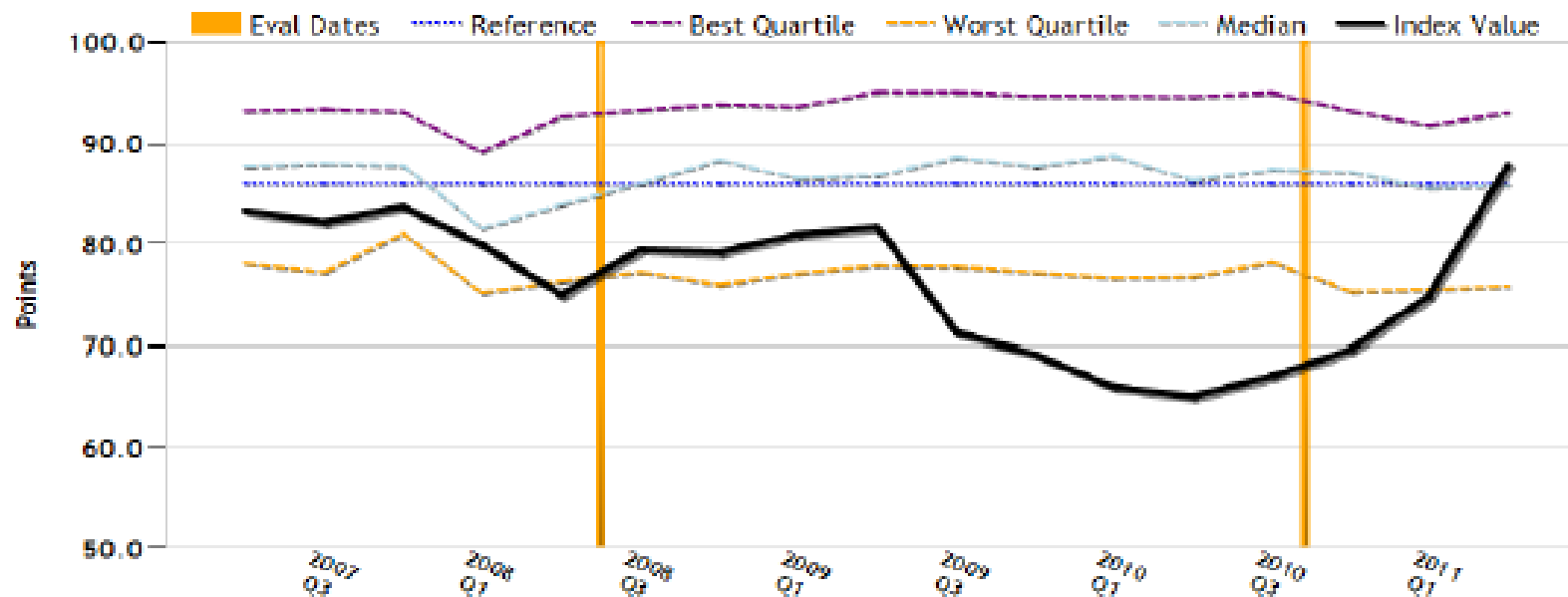
Good Performance 

Data Date 08/02/2011

### Millstone (Station)

Current Color Green 

Current Trend Improving trend last year and better than the Reference



# Safety at Millstone

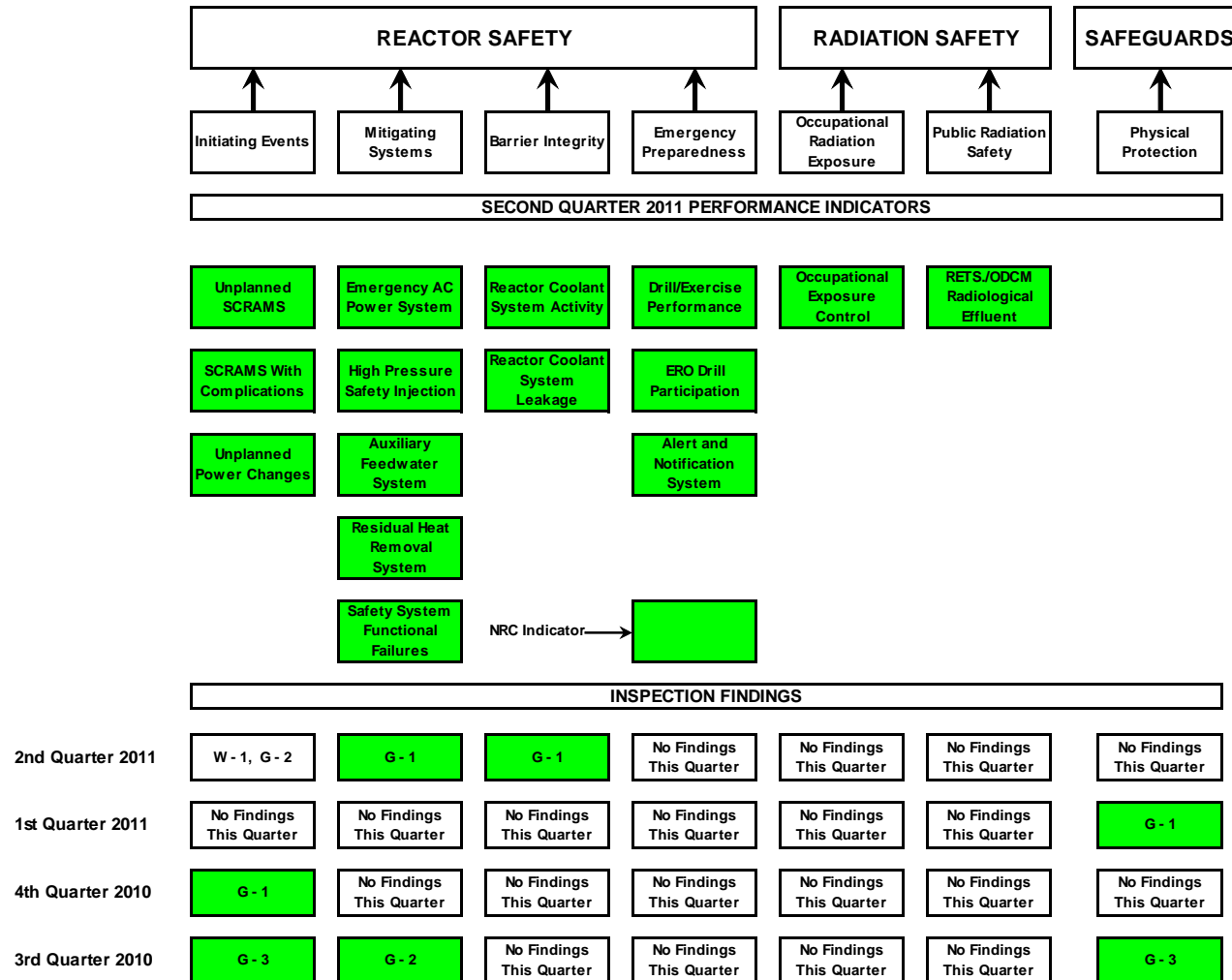
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- Protecting the health and safety of the public and employees is our number one priority
- Focus is on:
  - Nuclear Safety
  - Radiological Safety
  - Industrial Safety

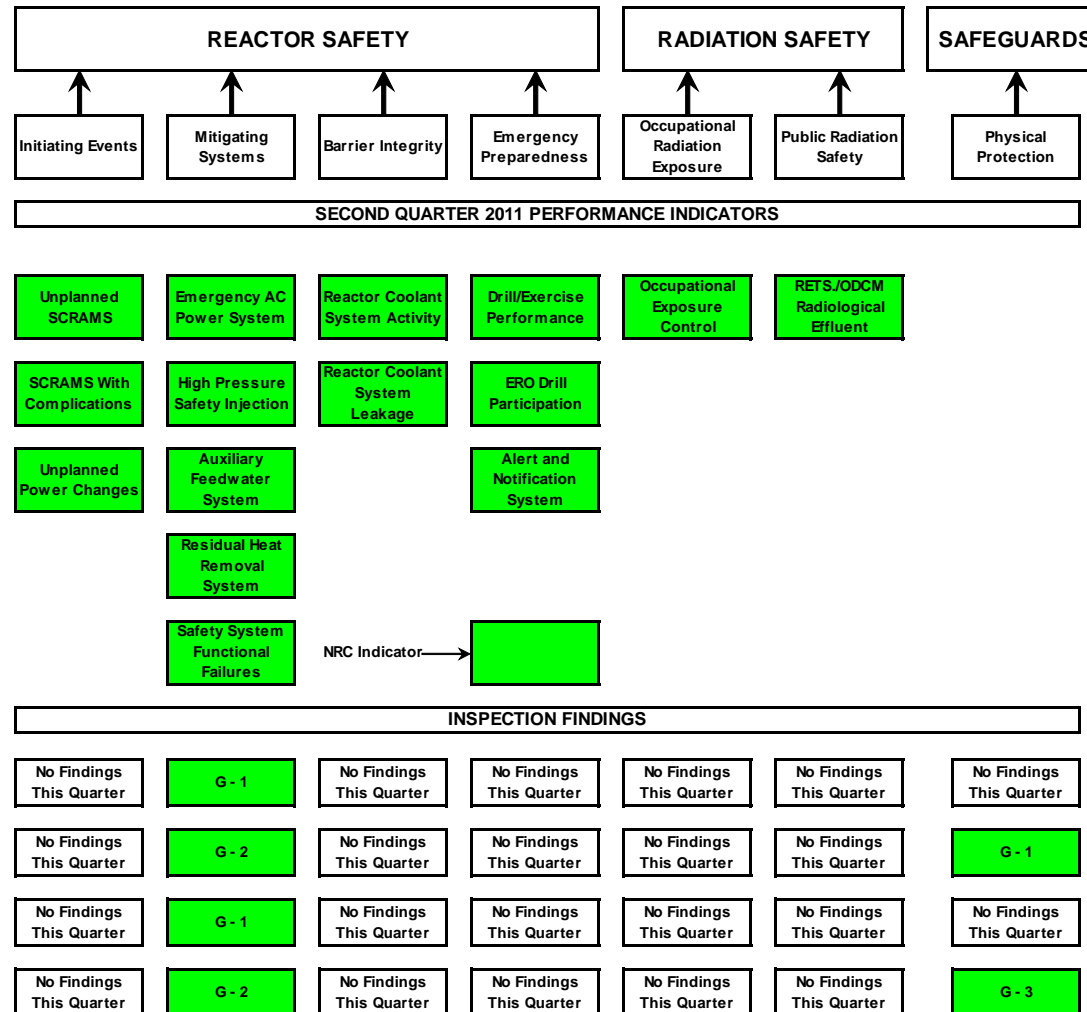
# Station Key Objectives 2011

Safety	Professional Excellence	Operational Excellence	Business Excellence	Corporate Citizenship
Keeping Dose ALARA	<b>*Coaching &amp; Reinforcing High Standards</b>	<b>*Station Equipment Works When Called Upon</b>	<b>*Efficiently Use Station Resources to Plan &amp; Complete Work Activities</b>	Excellence in Emergency Preparedness
Maintaining Station Configuration Control	Valued Workforce	Healthy PM Program	<b>*Choosing the Right Corrective Actions</b>	A Secure Millstone
Operational Risk & Conservative Decision-Making		Safe Reliable Top Quartile Performance	<b>*Closing Gaps Through Performance Improvement</b>	
No One Gets Hurt		Improved Feedwater Control		
		Meeting Outage Goals (20 x 15)		

# Unit 2 ROP Status Second Quarter



# Unit 3 ROP Status Second Quarter

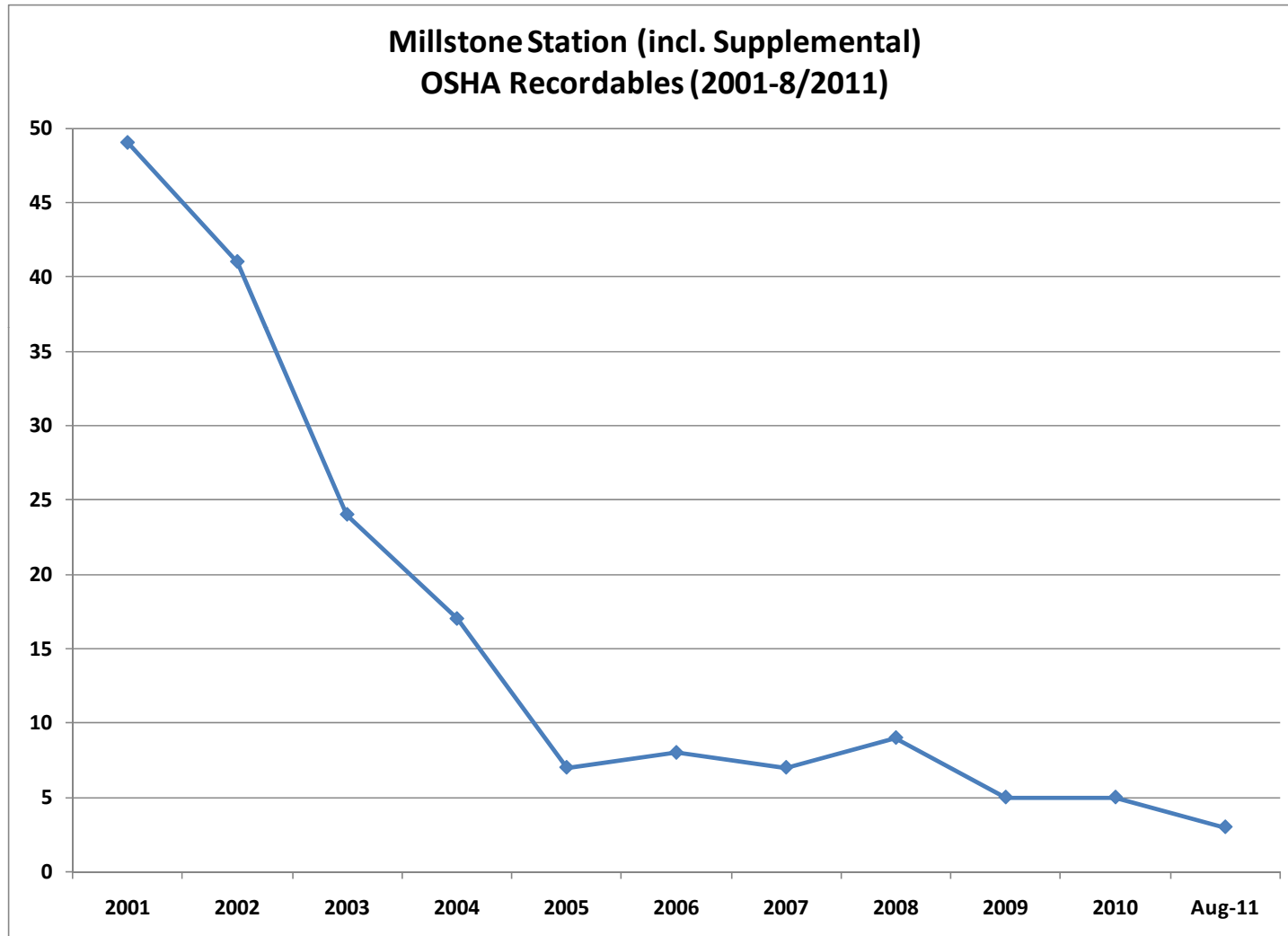


# Radiological Safety at Millstone

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- Installing permanent scaffolding in some areas of the station
- Have started using tungsten shielding and vests
- 2010 lowest year ever for on-line exposure at the station (6.655 rem)

# Industrial Safety at Millstone



# Investments for Reliability and Safety

*Dominion acquires MPS on 4/1/01 for \$1.3 billion*

*Further reliability investments of more than \$600 million*

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- 2002 - Rod control, heater and feed pump speed control replaced on Unit 2
- 2003 - Turbines replaced on Unit 2
- 2004 - New voltage regulator installed on Unit 3
- 2004 - Turbines replaced on Unit 3
- 2005 - Reactor vessel head replaced on Unit 2
- 2006 - Pressurizer replaced on Unit 2
- 2007, 2008, 2009 - New transformers for Units 2 & 3
- 2009, 2010 – Variable Frequency Drives installed at both units





# Millstone Outages

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## ➤ Millstone Unit 2 Spring Refueling Outage:

- Overall duration was Unit 2 best – 30.3 days
  - Window 1 Offline to Mode 5 – **Fleet Best** 9.08 Hours
  - Window 2 Mode 5 to Mode 6 – **Fleet Best** 57.28 Hours
  - Window 4 Core Offload – **Unit 2 Best** 64.83 Hours
  - Window 5 Rx Vessel Empty – Mode 0 – **Unit 2 Best** 108.15 Hours
- No unplanned risk level changes or challenges to key safety functions during 2R20
- Station record for outage exposure – 62.2 rem

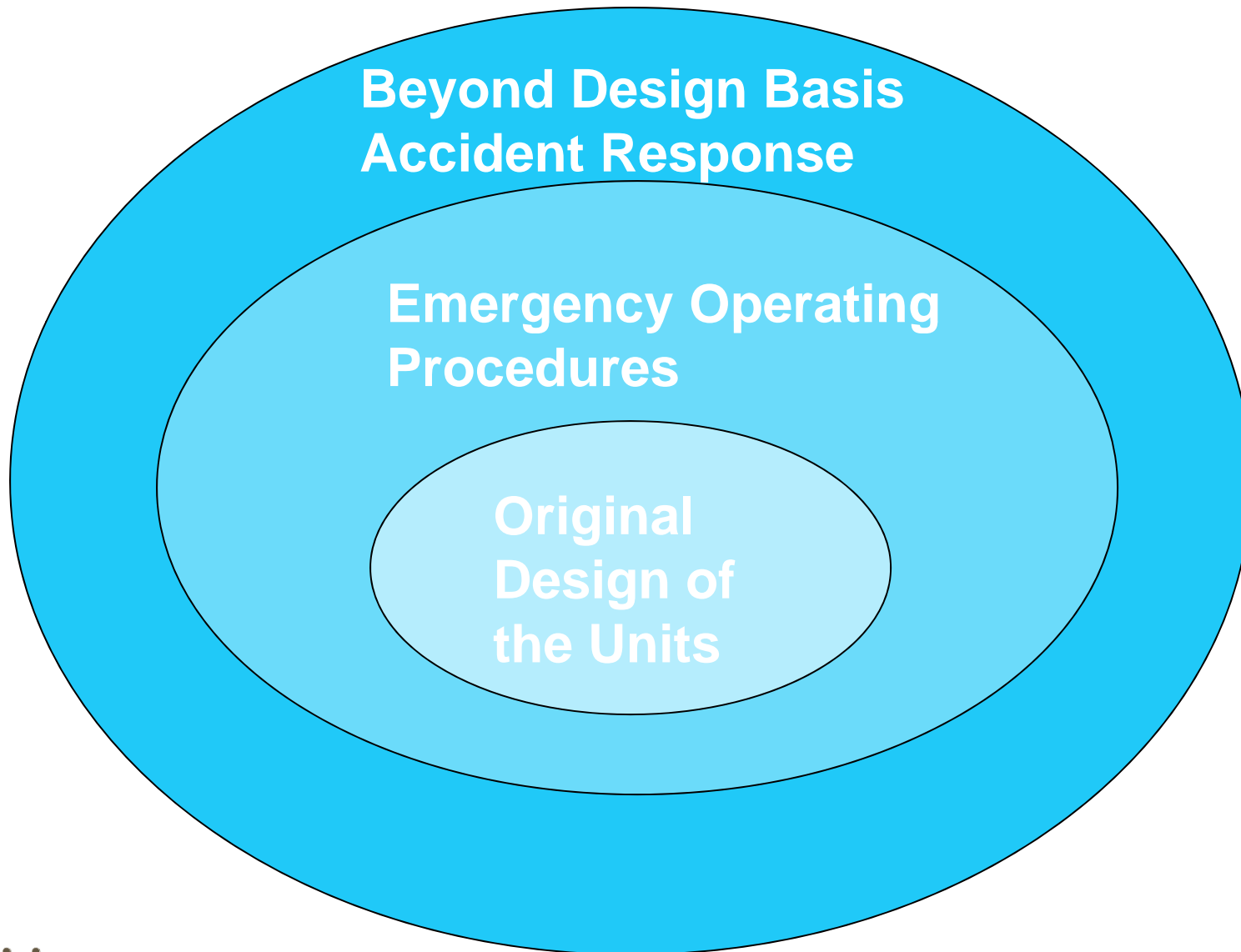
# Millstone Outages

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- Millstone Unit 3 Fall Refueling Outage:
  - Regularly scheduled maintenance and refueling outage
  - Scheduled to last about a month
  - Starting next month
  - Major activities include replacing 1/3 of the fuel, inspecting and repairing service water piping and work in our switchyard

# Natural Disaster Preparation and Response

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# Natural Disaster Preparation and Response

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- Robust Design and Comprehensive Training:
  - Our units are designed to withstand and safely operate or shutdown in a wide range of emergency situations, including earthquakes, flooding, extended loss of power and more
  - Stations maintain high levels of readiness to respond to all events
  - Worst-case accidents and acts of nature have been analyzed and procedures are in place to respond
  - Operators spend 20 percent of their time in training to respond to potential events

# Natural Disaster Preparation and Response

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- Dominion established a multidiscipline team after Fukushima:
  - Following the guidance provided by the Institute of Nuclear Power Operations (INPO)
  - Initiated new reviews of our equipment, training & procedures
  - Verified the capability our nuclear fleet to mitigate:
    - Events that are considered to be beyond the design basis
    - Total loss of offsite power
    - Internal and external flooding events

# Natural Disaster Preparation and Response

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- Multiple, redundant sources of electrical power and safety equipment
  - Diesel generators (equivalent to a locomotive engine)
- Robust barriers
  - Steel gates
  - Submarine doors
  - Tornado doors
- Multiple ways to access site
  - Barge
  - Rail

# Natural Disaster Preparation and Response

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## ➤ Millstone and Tropical Storm Irene:

- Staffed our emergency response facilities but did not activate them
- Worked closely with local, state and federal officials
- Reduced power at both of the units at request of ISO New England for grid stability
- Weathered the storm with no damage to the station
- Power to administrative buildings/Unit 1 Spent Fuel Pool was lost and restored within 15 hours

# Millstone Demographics

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- 1,100 full-time employees
  - FTE employees avg. \$89,000/yr
  - FTE “fully loaded” compensation \$144,000/yr
  - Employees avg. 19-years nuclear experience
- 800 – 1,100 supplemental employees during planned refueling outages (every 18-mos/unit)
- By 2015, 56.5% of Millstone employees will be retirement eligible (55 years old, 3+ years of service)



# Taxation and Millstone

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- Governor introduced generator tax
- In response Energy and Technology Committee introduced and passed SB 1176 which was tenfold
- Ultimately, generator tax on nuclear and fossil fuels was passed as part of budget:
  - Cost to Millstone of Gov's orig. proposal - \$32 million
  - Cost to Millstone of SB 1176 - \$330 million
  - Cost to Millstone of passed bill - \$40 million

# Taxation and Millstone

---

- Millstone's new state and local tax liability will be almost **\$80 Million annually** or **\$1.5 Million a week**
- Law has a built-in two year sunset provision
- Expect tax will be issue in coming years

# Visitors at Millstone

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- Local, State, Federal and International
  - Secretary of Energy Chu
  - Legislators
  - ISO New England
  - Nuclear Industry from China, Japan, South Africa

# Points of Contact

---

- Skip Jordan  
**Site Vice President**  
(860) 444-4292                      Skip.J.Jordan@dom.com
  
- Kevin Hennessy  
**Director – Government Affairs**  
(860) 444-5656                      Kevin.R.Hennessy@dom.com
  
- Ken Holt  
**Manager - Communications**  
(860) 440-0132                      Kenneth.A.Holt@dom.com





**Dominion<sup>®</sup>**

For additional information, visit us at  
[www.dom.com](http://www.dom.com)



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

September 1, 2011

Mr. David Heacock  
Sr. Vice President and Chief Nuclear Officer  
Dominion Resources  
500 Dominion Boulevard  
Glenn Allen, VA 23060-6711

SUBJECT: MID-CYCLE PERFORMANCE REVIEW AND INSPECTION PLAN -  
MILLSTONE POWER STATION UNIT 2 AND UNIT 3  
(REPORT 05000336/2011006 AND 05000423/2011006)

Dear Mr. Heacock:

On August 10, 2011, 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, 2010 through June 30, 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 having low to moderate safety significance (White) in the Initiating Events Cornerstone. The finding is associated with a performance deficiency involving 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) during the performance of quarterly main turbine control valve testing on February 12, 2011.

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 (Green) safety significance, and all PIs indicated that your performance was within the nominal, expected range (Green).

As a result of our review of Millstone Power Station performance, we plan to conduct a supplemental inspection for Unit 2 using 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 evaluates cross-cutting themes to determine whether a substantive cross-cutting issue exists in a particular area and to encourage licensees to take appropriate actions before more significant performance issues emerge. Regarding Millstone Power Station, the staff identified that there were four Green findings for the current twelve month assessment period with a documented cross-cutting aspect in the Problem Identification and Resolution cross-cutting area, and that there was a common cross-cutting theme associated with these findings. The theme was associated with the timeliness of corrective actions, which was the most significant contributor to the four Green findings [P.1(d)].

In evaluating the scope of efforts and progress in addressing the cross-cutting theme, the NRC staff determined that Dominion has recognized the cross-cutting theme and has initiated action to develop an improvement plan. Therefore, the staff has determined that a substantive cross-cutting issue in the Problem Identification and Resolution cross-cutting area does not exist at this time. We will monitor your progress in the Problem Identification and Resolution cross-cutting area through the baseline inspection program, including a focused review of your proposed corrective action plan.

The enclosed inspection plan lists the inspections scheduled through December 31, 2012. Routine inspections performed by resident inspectors are not included in the inspection plan. 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.

In the days following the Fukushima Daiichi nuclear accident in Japan, the Commission directed the staff to establish a senior-level agency task force to conduct a methodical and systematic review of the NRC's processes and regulations to determine whether the agency should make additional improvements to its regulatory system. The NRC has since completed Temporary Instruction (TI) 183, "Follow-up to Fukushima Daiichi Nuclear Station Fuel Damage Event," and TI-184, "Availability and Readiness Inspection of Severe Accident Management Guidelines (SAMGs)" at your facility. Results of these inspections can be found here: <http://www.nrc.gov/japan/japan-activities.html>. Additionally, on May 11, 2011, the agency issued NRC Bulletin 2011-01, "Mitigating Strategies," to confirm compliance with Order EA-02-026, subsequently imposed license conditions, and 10 CFR 50.54(hh)(2), and to determine the status of licensee mitigating strategies programs. On July 12, 2011, the NRC's Task Force made its recommendations to the Commission in its report, "Recommendations for Enhancing Reactor Safety in the 21<sup>st</sup> Century: The Near-Term Task Force Review of Insights from the Fukushima Daiichi Accident." The NRC is currently reviewing the Task Force's recommendations to determine what additional actions may be warranted.

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 document 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 feel free to contact Dr. Ronald R. Bellamy at (610) 337-5200 with any questions you have regarding this letter.

Sincerely,

A handwritten signature in black ink, appearing to read "Darrell J. Roberts", with a long horizontal flourish extending to the right.

Darrell J. Roberts, 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



D. Heacock

3

Please feel free to 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 No. DPR-65, NPF-49

Enclosure: Millstone Inspection/Activity Plan

cc w/encl: Distribution via ListServ

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C. Kowalyshyn, OA  
DRS Branch Chiefs (6)  
N. McNamara, SLO  
D. Tiff, SLO  
D. Screnci, PAO,  
N. Sheehan, PAO

R. Barkley, ORA  
ROAssessment Resource  
RidsNrrDirslpabResource  
RidsNRRPM Millstone Resource  
RidsNRRDorlLpl1-2 Resource  
ROPreportsResource

**SUNSI Review Complete:**     TCS     (Reviewer's Initials)

**DOCUMENT NAME:** S:\ROP-12 Mid-Cycle Review\Branch 5\MSMS Mid-Cycle Letter 2011rev2.docx

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**ML112440012**

OFFICE	<i>lhp</i>	RI/DRP	RI/DRP	RI/DRP
NAME		TSetzer/tcs	RBellamy/tcs for	DRoberts/djr
DATE		08/31/11	08/31/11	08/31/11

## Millstone

## Inspection / Activity Plan

07/01/2011 - 12/31/2012

Unit Number	Planned Dates Start End	Inspection Activity	Title	No. of Staff on Site
		<b>07/11EXM - OPERATOR LICENSING INITIAL EXAMS</b>		<b>3</b>
3	07/11/2011 07/20/2011	U01832	FY11- MILLSTONE 3, INITIAL OL EXAM	
		<b>3/14EXM - INITIAL OPERATOR LICENSING U2 EXAMS</b>		<b>3</b>
2	09/07/2011 09/09/2011	U01834	FY11- MILLSTONE 2, INITIAL OL EXAM	
2	10/03/2011 10/14/2011	U01834	FY11- MILLSTONE 2, INITIAL OL EXAM	
		<b>711111B - MS3 REQUAL INSP W/ P/F RESULTS</b>		<b>2</b>
2,3	08/29/2011 09/02/2011	IP 7111111B	Licensed Operator Requalification Program	
		<b>EP PROGR - EP PROGRAM INSPECTION</b>		<b>1</b>
2,3	08/01/2011 08/05/2011	IP 7111402	Alert and Notification System Testing	
2,3	08/01/2011 08/05/2011	IP 7111403	Emergency Preparedness Organization Staffing and Augmentation System	
2,3	08/01/2011 08/05/2011	IP 7111404	Emergency Action Level and Emergency Plan Changes	
2,3	08/01/2011 08/05/2011	IP 7111405	Correction of Emergency Preparedness Weaknesses and Deficiencies	
2,3	08/01/2011 08/05/2011	IP 71151-EP02	ERO Drill Participation	
2,3	08/01/2011 08/05/2011	IP 71151-EP03	Alert & Notification System	
2,3	08/01/2011 08/07/2011	IP 71151-EP01	Drill/Exercise Performance	
		<b>71124 - PUB RAD SAFETY - REMP</b>		<b>1</b>
2,3	08/22/2011 08/26/2011	IP 71124.07	Radiological Environmental Monitoring Program	
		<b>71124 - OCC RAD SAFETY</b>		<b>1</b>
2,3	10/17/2011 10/21/2011	IP 71124.01	Radiological Hazard Assessment and Exposure Controls	
2,3	10/17/2011 10/21/2011	IP 71124.02	Occupational ALARA Planning and Controls	
2,3	10/17/2011 10/21/2011	IP 71124.04	Occupational Dose Assessment	
		<b>7111108P - U3 INSERVICE INSPECTION</b>		<b>1</b>
3	10/17/2011 10/28/2011	IP 7111108P	Inservice Inspection Activities - PWR	
		<b>TI-177 - MANAGING GAS ACCUMULATION IN ECCS</b>		<b>3</b>
2,3	01/30/2012 02/03/2012	IP 2515/177	Managing Gas Accumulation In Emergency Core Cooling, Decay Heat Removal & Containment Spray System	
		<b>71124 - OCC RAD SAFETY</b>		<b>1</b>
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	
		<b>7111121 - CDBI</b>		<b>6</b>
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	

This report does not include INPO and OUTAGE activities.  
This report shows only on-site and announced inspection procedures.

**Millstone**  
**Inspection / Activity Plan**  
 07/01/2011 - 12/31/2012

Unit Number	Planned Dates Start	Planned Dates End	Inspection Activity	Title	No. of Staff on Site
			<b>EP EX - EP EXERCISE EVALUATION</b>		<b>5</b>
2, 3	08/05/2012	08/11/2012	IP 7111401	Exercise Evaluation	
2, 3	08/05/2012	08/11/2012	IP 7111404	Emergency Action Level and Emergency Plan Changes	
			<b>71152B - PI&amp;R</b>		<b>4</b>
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	
			<b>711111B - MS2 ON-SITE REQUAL INSP W/ P/F RESULTS</b>		<b>2</b>
2, 3	09/17/2012	09/21/2012	IP 711111B	Licensed Operator Requalification Program	
			<b>71124 - RMS</b>		<b>1</b>
2, 3	08/13/2012	08/17/2012	IP 71124.05	Radiation Monitoring Instrumentation	
			<b>71124 - RW</b>		<b>1</b>
2, 3	09/10/2012	09/14/2012	IP 71124.08	Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation	
			<b>7111108P - UNIT 2 INSERVICE INSPECTION</b>		<b>1</b>
2	10/15/2012	10/26/2012	IP 7111108P	Inservice Inspection Activities - PWR	
			<b>71124 - OCC RAD SAFETY</b>		<b>1</b>
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	

This report does not include INPO and OUTAGE activities.  
 This report shows only on-site and announced inspection procedures.

**NUCLEAR ENERGY ADVISORY COUNCIL**  
**7:00 PM**  
**December 8, 2011**  
**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  
Mr. Robert Klancko  
Rep. Kevin Ryan  
Dr. Edward Wilds representing Commissioner Esty

**1. Call to Order of Meeting**

NEAC Chair Sheehan called the meeting to order at 7:01 PM at Waterford Town Hall, Waterford, CT

**2. Approval of Minutes of September 22, 2011 NEAC meeting**

Approval of Minutes of September 23, 2010 as presented. Motion was made and seconded by Mr. Klancko/Mr. Hicks 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.

**5. CY 2011 Annual Report Discussions**

The Council discussed the 2011 Annual Report. Only minor edits made to clarify activities of the State of Connecticut at the Connecticut Yankee Site.

**6. CY 2011 Annual Report Approval**

Motion made by Mr. Klancko and seconded by Ms. DeBold to approve the 2011 Annual Report with the minor edits discussed; no objections; unanimous vote in favor.

**7. Approval of Regular Meeting Schedule for CY 2012**

Motion was made by Ms. Rathbun and seconded by Mr. Klancko to accept 2012 meeting schedule as presented; no objections; unanimous vote in favor.

**8. Programs for CY 2012**

Council discussed potential topics for 2012. See Attached list of potential topics.

**9. Next Meeting Date and Time**

April 19, 2012 at Waterford Town Hall. Time to be determined in coordination with the U.S. Nuclear Regulatory Commission.

**10. Adjournment**

Motion was made by Mr. Klancko and seconded Mr. Hicks to adjourn; no objections; unanimous vote in favor; meeting adjourned at 7:42 PM.



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

September 30, 2011

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

SUBJECT: MILLSTONE POWER STATION UNITS 2 AND 3 - ISSUANCE OF  
AMENDMENTS RE: CYBER SECURITY PLAN (TAC NOS. ME4320 AND  
ME4321)

Dear Mr. Heacock:

The Nuclear Regulatory Commission has issued the enclosed amendments:

Amendment No. 309 to Renewed Facility Operating License No. DPR-65 for Millstone Power Station Unit 2, revising License Condition 2.C.(4)

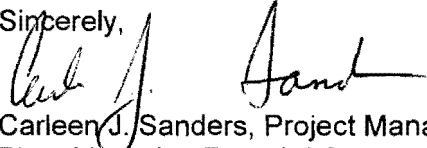
Amendment No. 251 to Renewed Facility Operating License No. NPF-49 for Millstone Power Station Unit 3, revising License Condition 2.E

The amendments consist of changes to the operating licenses in response to your application dated July 12, 2010, as supplemented by letters dated August 5, 2010, September 23, 2010, November 10, 2010, December 13, 2010, April 4, 2011, May 17, 2011, and August 4, 2011.

The amendments approve the Cyber Security Plan (CSP) and associated implementation schedule for the nuclear plants named above, and revise the license condition regarding physical protection for each nuclear unit to reflect such approval. The amendments specify that the licensee fully implement and maintain in effect all provisions of the Commission-approved CSP as required by 10 CFR 73.54.

A copy of the NRC staff's related safety evaluation is also enclosed. A Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

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

Enclosures:

1. Amendment No. 309 to DPR-65
2. Amendment No. 251 to NPF-49
3. Safety Evaluation

cc w/encls: Distribution via ListServ



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

DOMINION NUCLEAR CONNECTICUT, INC.

DOCKET NO. 50-336

MILLSTONE POWER STATION, UNIT NO. 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 309  
Renewed License No. DPR-65

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Dominion Nuclear Connecticut, Inc. dated July 12, 2010, as supplemented by letters dated August 5, 2010, September 23, 2010, November 10, 2010, December 13, 2010, April 4, 2011, May 17, 2011, and August 4, 2011, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes as indicated in the attachment to this license amendment, and paragraph 2.C.(4) of Renewed Facility Operating License No. DPR-65 is hereby amended to read as follows:

(4) Physical Protection

The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security, training and qualification, and safeguards contingency plans including amendments made pursuant to provision

of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The combined set of plans, submitted by letter dated October 15, 2004, as supplemented by letter dated May 15, 2006, is entitled: "Millstone, North Anna and Surry Power Stations' Security Plan, Training and Qualification Plan, Safeguards Contingency Plan, and Independent Spent Fuel Storage Installation Security Program, Revision 0." The set contains Safeguards Information protected under 10 CFR 73.21.

The licensee shall fully implement and maintain in effect all provisions of the Commission-approved Kewaunee, Millstone, North Anna, and Surry Power Stations Cyber Security Plan (CSP), including changes made pursuant to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The CSP was approved by License Amendment No. 309.

3. This license amendment is effective as of the date of issuance. The implementation of the CSP, including the key intermediate milestone dates and the full implementation date, shall be in accordance with the implementation schedule submitted by the licensee on April 4, 2011, and approved by the NRC staff with this license amendment. All subsequent changes to the NRC-approved CSP implementation schedule will require prior NRC approval pursuant to 10 CFR 50.90.

FOR THE NUCLEAR REGULATORY COMMISSION



Harold K. Chernoff, Chief  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment: Changes to DPR-65

Date of Issuance: September 30, 2011



ATTACHMENT TO LICENSE AMENDMENT NO. 309  
RENEWED FACILITY OPERATING LICENSE NO. DPR-65  
DOCKET NO. 50-336

Replace the following page of Facility Operating License DPR-65 with the attached revised page. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

REMOVE

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INSERT

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(3) Fire Protection

The licensee shall implement and maintain in effect all provisions of the approved fire protection program as described in the Final Safety Analysis Report and as approved in the SER dated September 19, 1978, and supplements dated October 21, 1980, November 11, 1981, October 31, 1985, April 15, 1986, January 15, 1987, April 29, 1988, July 17, 1990, and November 3, 1995, subject to the following provision:

The licensee may make changes to the approved Fire Protection Program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

(4) Physical Protection

The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security, training and qualification, and safeguards contingency plans including amendments made pursuant to provision of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The combined set of plans, submitted by letter dated October 15, 2004, as supplemented by letter dated May 15, 2006, is entitled: "Millstone, North Anna and Surry Power Stations' Security Plan, Training and Qualification Plan, Safeguards Contingency Plan, and Independent Spent Fuel Storage Installation Security Program, Revision 0" The set contains Safeguards Information protected under 10 CFR 73.21.

The licensee shall fully implement and maintain in effect all provisions of the Commission-approved Kewaunee, Millstone, North Anna, and Surry Power Stations Cyber Security Plan (CSP), including changes made pursuant to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The CSP was approved by License Amendment No. 309.

(5) Relocated Technical Specifications

The licensee shall relocate certain technical specification requirements to licensee-controlled documents as described below. The location of these requirements shall be retained by the licensee.

- a. This license condition approves the relocation of certain technical specification requirements to licensee-controlled documents (Technical Requirements Manual), as described in the licensee's application dated May 20, 1997, as supplemented on September 23, 1997. The approval is documented in the staff's safety evaluation dated November 19, 1997. This license condition is effective as of its date of issuance by Amendment No. 210 and shall be implemented 90 days from the date of issuance. Implementation shall include the relocation of technical specification requirements to the appropriate licensee-controlled document as identified in the licensee's application dated May 20, 1997, as supplemented on September 23, 1997.



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

DOMINION NUCLEAR CONNECTICUT, INC.

DOCKET NO. 50-423

MILLSTONE POWER STATION, UNIT NO. 3

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 251  
Renewed License No. NPF-49

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Dominion Nuclear Connecticut, Inc. dated July 12, 2010, as supplemented by letters dated August 5, 2010, September 23, 2010, November 10, 2010, December 13, 2010, April 4, 2011, May 17, 2011, and August 4, 2011, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes as indicated in the attachment to this license amendment, and paragraph 2.E of Renewed Facility Operating License No. DPR-49 is hereby amended to read as follows:

The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security, training, and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search Requirements

revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The combined set of plans, submitted by letter dated October 15, 2004, as supplemented by letter dated May 15, 2006, is entitled: "Millstone, North Anna and Surry Power Stations' Security Plan, Training and Qualification Plan, Safeguards Contingency Plan, and Independent Spent Fuel Storage Installation Security Program, Revision 0." The set contains Safeguards Information protected under 10 CFR 73.21.

The licensee shall fully implement and maintain in effect all provisions of the Commission-approved Kewaunee, Millstone, North Anna, and Surry Power Stations Cyber Security Plan (CSP), including changes made pursuant to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The CSP was approved by License Amendment No. 251.

3. This license amendment is effective as of the date of issuance. The implementation of the CSP, including the key intermediate milestone dates and the full implementation date, shall be in accordance with the implementation schedule submitted by the licensee on April 4, 2011, and approved by the NRC staff with this license amendment. All subsequent changes to the NRC-approved CSP implementation schedule will require prior NRC approval pursuant to 10 CFR 50.90.

FOR THE NUCLEAR REGULATORY COMMISSION



Harold K. Chernoff, Chief  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment: Changes to NPF-49

Date of Issuance: September 30, 2011

ATTACHMENT TO LICENSE AMENDMENT NO. 251

RENEWED FACILITY OPERATING LICENSE NO. NPF-49

DOCKET NO. 50-423

Replace the following page of Facility Operating License NPF-49 with the attached revised page. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

REMOVE

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INSERT

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- E. The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security, training, and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The combined set of plans, submitted by letter dated October 15, 2004, as supplemented by letter dated May 15, 2006, is entitled: "Millstone, North Anna and Surry Power Stations' Security Plan, Training and Qualification Plan, Safeguards Contingency Plan, and Independent Spent Fuel Storage Installation Security Program, Revision 0" The set contains Safeguards Information protected under 10 CFR 73.21.

The licensee shall fully implement and maintain in effect all provisions of the Commission-approved Kewaunee, Millstone, North Anna, and Surry Power Stations Cyber Security Plan (CSP), including changes made pursuant to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The CSP was approved by License Amendment No. 251.

- F. Deleted.
- G. The licensee shall have and maintain financial protection of such type and in such amounts as the Commission shall require in accordance with Section 170 of the Atomic Energy Act of 1954, as amended, to cover public liability claims.
- H. Fire Protection (Section 9.5.1, SER, SSER 2, SSER 4, SSER 5)

DNC shall implement and maintain in effect all provisions of the approved fire protection program as described in the Final Safety Analysis Report for the facility and as approved in the SER (NUREG-1031) issued July 1985 and Supplements Nos. 2, 4, and 5 issued September 1985, November 1985, and January 1986, respectively, subject to the following provision:

The licensee may make changes to the approved fire protection program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

- I. This renewed operating license is effective as of its date of issuance and shall expire at midnight on November 25, 2045.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

J. E. Dyer, Director

Office of Nuclear Reactor Regulation

Attachments:

1. Appendix A - Technical Specifications
2. Appendix B - Environmental Protection Plan

Date of Issuance: November 28, 2005

Renewed License No. NPF-49  
Amendment No. 243, 251



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

SAFETY EVALUATION BY THE  
OFFICE OF NUCLEAR SECURITY AND INCIDENT RESPONSE

RELATED TO

AMENDMENT NO. 309 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-65

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

AMENDMENT NO. 251 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-49

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

1.0 INTRODUCTION

By letter dated November 20, 2009,<sup>1</sup> as supplemented by letters dated July 12, 2010, August 5, 2010, September 23, 2010, November 10, 2010, December 13, 2010, April 4, 2011, May 17, 2011, and August 4, 2011,<sup>2</sup> Dominion Resources Services, Inc. (Dominion) submitted a license amendment request. Included in that license amendment request was a request for approval of the licensee's Cyber Security Plan (CSP) and Implementation Schedule for the Kewaunee Power Station (Kewaunee); the Millstone Power Station (Millstone), Units 2 and 3; the North Anna Power Station (North Anna), Units 1 and 2; and the Surry Power Station (Surry), Units 1 and 2, as required by Title 10 of the *Code of Federal Regulations* (10 CFR) 73.54. On November 10, 2010, the licensee supplemented its CSP, to address: (1) scope of systems in response to the October 21, 2010, U.S. Nuclear Regulatory Commission (NRC, the Commission) decision (Reference 4); (2) records retention; and (3) implementation schedule. In the May 17, 2011, supplement, having integrated information from its supplements dated August 5, 2010, through April 4, 2011, the licensee submitted a consolidated Cyber Security Plan, which it identified as Revision 0. Revision 0 designates the CSP that the licensee will implement. The August 4, 2011, supplement revised the license condition wording for Millstone to be in agreement with the language proposed by the NRC staff. The Kewaunee, North Anna, and Surry license amendment requests were reviewed separately and approved by the NRC on August 31, 2011.<sup>3</sup>

The November 20, 2009, July 12, 2010, August 5, 2010, November 10, 2010, December 13, 2010, April 4, 2011, and May 17, 2011, letters have attachments that are being withheld from public disclosure because they contain sensitive unclassified non-safeguards information (security-related).

<sup>1</sup> Agencywide Documents Access and Management System (ADAMS) Accession No. ML093360247.

<sup>2</sup> ADAMS Accession Nos. ML102010091, ML102210284, ML102670641, ML103160422, ML103560083, ML110960665, ML11143A063, and ML11222A083, respectively.

<sup>3</sup> ADAMS Accession No. ML11192A249.

Enclosure

The July 12, 2010, August 5, 2010, September 23, 2010, November 10, 2010, December 13, 2010, April 4, 2011, May 17, 2011, and August 4, 2011, supplements contained clarifying information and did not change the NRC staff's initial proposed finding of no significant hazards consideration determination as published in the *Federal Register* on February 1, 2011 (76 FR 5616).

The amendments would approve the CSP and associated implementation schedule and revise the affected facility operation licenses as follows:

- 1 – Paragraph 2.C.(4) of Renewed Facility Operating License No. DPR-65 for Millstone Power Station Unit No. 2
- 2 – Paragraph 2.E of Renewed Facility Operating License No. NPF-49 for Millstone Power Station Unit No. 3

The amendments provide a license condition to require each licensee to fully implement and maintain in effect all provisions of the NRC-approved CSP. The proposed change is generally consistent with Nuclear Energy Institute (NEI) 08-09, Revision 6, "Cyber Security Plans For Nuclear Power Plants."

## 2.0 REGULATORY EVALUATION

### 2.1 General Requirements

Consistent with 10 CFR 73.54(a), the licensee must provide high assurance that digital computer and communication systems, and networks are adequately protected against cyber attacks, up to and including the design basis threat (DBT), as described in 10 CFR 73.1. The licensee shall protect digital computer and communication systems and networks associated with: (i) safety-related and important-to-safety functions; (ii) security functions; (iii) emergency preparedness functions, including offsite communications; and (iv) support systems and equipment which, if compromised, would adversely impact safety, security, or emergency preparedness (SSEP) functions. The rule specifies that digital computer and communication systems and networks associated with these functions must be protected from cyber attacks that would adversely impact the integrity or confidentiality of data and software; deny access to systems, services, or data; or provide an adverse impact to the operations of systems, networks, and associated equipment.

In the October 21, 2010, Staff Requirements Memorandum (SRM)-COMWCO-10-0001,<sup>4</sup> the Commission stated that 10 CFR 73.54 should be interpreted to include structures, systems, and components (SSCs) in the balance of plant (BOP) that have a nexus to radiological health and safety. The NRC staff determined that SSCs in the BOP that have a nexus to radiological health and safety are those that could directly or indirectly affect reactivity of a nuclear power plant (NPP), and are therefore within the scope of important-to-safety functions described in 10 CFR 73.54(a)(1).

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<sup>4</sup> ADAMS Accession No. ML102940009.



## 2.2 Elements of a CSP

As required by 10 CFR 73.54(e), the licensee must establish, implement, and maintain a CSP that satisfies the Cyber Security Program requirements of this regulation. In addition, the CSP must describe how the licensee will implement the requirements of the regulation and must account for the site-specific conditions that affect implementation. One method of complying with this regulation is to describe within the CSP how the licensee will achieve high assurance that all SSEP functions are protected from cyber attacks.

## 2.3 Regulatory Guide (RG) 5.71 and Nuclear Energy Institute (NEI) 08-09, Revision 6

NRC Regulatory Guide (RG) 5.71, "Cyber Security Programs for Nuclear Facilities," (Reference 1) describes a regulatory position that promotes a defensive strategy consisting of a defensive architecture and a set of security controls based on standards provided in the National Institute of Standards and Technology (NIST) Special Publication (SP) 800-53, "Recommended Security Controls for Federal Information Systems and Organizations," and NIST SP 800-82, "Guide to Industrial Control Systems Security," dated September 29, 2008. NIST SP 800-53 and NIST SP 800-82 are based on well-understood cyber threats, risks, and vulnerabilities, coupled with equally well-understood countermeasures and protective techniques. RG 5.71 divides the above-noted security controls into three broad categories: technical, operational, and management.

RG 5.71 provides a framework to aid in the identification of those digital assets that licensees must protect from cyber attacks. These identified digital assets are referred to as "critical digital assets" (CDAs). Licensees should address the potential cyber security risks to CDAs by applying the defensive architecture and addressing the collection of security controls identified in RG 5.71. RG 5.71 includes a CSP template that provides one method for preparing an acceptable CSP.

The organization of RG 5.71 reflects the steps necessary to meet the requirements of 10 CFR 73.54. Section C.3 of RG 5.71, describes an acceptable method for implementing the security controls, as detailed in Appendix B, "Technical Controls," and Appendix C, "Operational and Management Controls." Section C.4 of RG 5.71 discusses the need to maintain the established cyber security program, including comprehensive monitoring of the CDAs and the effectiveness of their security protection measures, ensuring that changes to the CDAs or the environment are controlled, coordinated, and periodically reviewed for continued protection from cyber attacks. Section C.5 of RG 5.71 provides licensees and applicants with guidance for retaining records associated with their cyber security programs. Appendix A to RG 5.71 provides a template for a generic CSP which licensees may use to comply with the licensing requirements of 10 CFR 73.54. Appendices B and C provide an acceptable set of security controls, which are based on well-understood threats, vulnerabilities, and attacks, coupled with equally well-understood and vetted countermeasures and protective techniques.

NEI 08-09, Revision 6 (Reference 2), closely maps with RG 5.71; Appendix A of NEI 08-09, Revision 6, contains a CSP template that is comparable to Appendix A of RG 5.71. Appendix D of NEI 08-09, Revision 6, contains technical cyber security controls that are comparable to Appendix B of RG 5.71. Appendix E of NEI 08-09, Revision 6, contains operational and management cyber security controls that are comparable to Appendix C of RG 5.71.

The NRC staff stated in a letter (Subject: Nuclear Energy Institute [NEI] 08-09, "Cyber Security Plan Template," Revision 6), dated May 5, 2010,<sup>5</sup> that the licensee may use the template in NEI 08-09, Revision 6, to prepare an acceptable CSP, with the exception of the definition of "cyber attack." The NRC staff subsequently reviewed and approved by letter dated June 7, 2010,<sup>6</sup> a definition for "cyber attack" to be used in submissions based on NEI 08-09, Revision 6 (Reference 3). The licensee submitted a CSP for the Kewaunee Power Station; the Millstone Power Station, Units 2 and 3; the North Anna Power Station, Units 1 and 2; and the Surry Power Station, Units 1 and 2, that was based on the template provided in NEI 08-09, Revision 6, and included in the deviation table a definition of cyber attack that was acceptable to the NRC staff. Additionally, the licensee submitted a supplement to their CSP on November 10, 2010, to include information on SSCs in the BOP that, if compromised, could affect NPP reactivity.

RG 5.71 and NEI 08-09, Revision 6, are comparable documents; both are based on essentially the same general approach and same set of technical, operational, and management security controls. The submitted CSP was reviewed against the corresponding sections in RG 5.71.

### 3.0 TECHNICAL EVALUATION

The NRC staff performed a technical evaluation of the licensee's submittal. The licensee's submittal, with the exception of deviations described in Section 4.0, generally conformed to the guidance in NEI 08-09, Revision 6, which was found to be acceptable by the NRC staff and comparable to RG 5.71 to satisfy the requirements contained in 10 CFR 73.54. The NRC staff reviewed the licensee's submittal against the requirements of 10 CFR 73.54 following the guidance contained in RG 5.71. The NRC staff's evaluation of each section of the submittal is discussed below.

#### 3.1 Scope and Purpose

The licensee's CSP establishes a means to achieve high assurance that digital computer and communication systems and networks associated with the following functions are adequately protected against cyber attacks up to and including the DBT:

1. Safety-related and important-to-safety functions;
2. Security functions;
3. Emergency preparedness functions, including offsite communications; and
4. Support systems and equipment which, if compromised, would adversely impact SSEP functions.

The submitted CSP describes achievement of high assurance of adequate protection of systems associated with the above functions from cyber attacks by:

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<sup>5</sup> ADAMS Accession No. ML101190371.

<sup>6</sup> ADAMS Accession No. ML101550052.

- Implementing and documenting the “baseline” security controls as described in Section 3.1.6 of NEI 08-09, Revision 6, which is comparable to Regulatory Position C.3.3 described in RG 5.71; and
- Implementing and documenting a Cyber Security Program to maintain the established cyber security controls through a comprehensive life cycle approach as described in Section 4 of NEI 08-09, Revision 6, which is comparable to Appendix A, Section A.2.1 of RG 5.71.

Thus, the licensee’s CSP, as originally submitted, is comparable to the CSP in NEI-08-09, Revision 6. However, in its submittal dated November 10, 2010, the licensee clarified its original submission and indicated that the scope of systems includes those BOP SSCs that have an impact on NPP reactivity, if compromised. This is in response to and consistent with SRM COMWCO-10-0001, in which the Commission stated that the NRC’s cyber security rule at 10 CFR 73.54 should be interpreted to include SSCs in the BOP that have a nexus to radiological health and safety. The NRC staff determined that those systems that have a nexus to radiological health and safety that could directly or indirectly affect reactivity of a NPP, are therefore within the scope of important-to-safety functions described in 10 CFR 73.54(a)(1).

The NRC staff reviewed the CSP and supplemental information submitted by the licensee and found no deviation from Regulatory Position C.3.3 in RG 5.71 and Appendix A, Section A.2.1 of RG 5.71. The NRC staff finds that the licensee established adequate measures to implement and document the Cyber Security Program, including baseline security controls.

Based on the above, the NRC staff finds that the CSP adequately establishes the Cyber Security Program, including baseline security controls.

### 3.2 Analyzing Digital Computer Systems and Networks and Applying Cyber Security Controls

The licensee’s CSP describes that the Cyber Security Program is established, implemented, and maintained as described in Section 3.1 of NEI 08-09, Revision 6, which is comparable to Regulatory Position C.3.1 described in RG 5.71 to:

- Analyze digital computer and communications systems and networks; and
- Identify those assets that must be protected against cyber attacks to satisfy 10 CFR 73.54(a).

The submitted CSP describes how the cyber security controls in Appendices D and E of NEI 08-09, Revision 6, which are comparable to Appendices B and C in RG 5.71, are addressed to protect CDAs from cyber attacks.

This section is comparable to Regulatory Position C.3.1 in RG 5.71, without deviation.

Based on the above, the NRC staff finds that the CSP adequately addresses security controls.

### 3.3 Cyber Security Assessment and Authorization

The licensee provided information addressing the creation of a formal, documented, cyber security assessment and authorization policy. This included a description concerning the creation of a formal, documented procedure comparable to Section 3.1.1 of NEI 08-09, Revision 6.

The NRC staff finds that the licensee established adequate measures to define and address the purpose, scope, roles, responsibilities, management commitment, and coordination, and facilitates the implementation of the cyber security assessment and authorization policy.

The NRC staff reviewed the above information and found no deviation from Section 3.1.1 of NEI 08-09, Revision 6, which is comparable to Regulatory Position C.3.1.1 and Appendix A, Section A 3.1.1 of RG 5.71.

Based on the above, the NRC staff finds that the CSP adequately established controls to develop, disseminate, and periodically update the cyber security assessment and authorization policy and implementing procedure.

### 3.4 Cyber Security Assessment Team (CSAT)

The CSAT responsibilities include conducting the cyber security assessment, documenting key findings during the assessment, and evaluating assumptions and conclusions about cyber security threats. The submitted CSP outlines the requirements, roles and responsibilities of the CSAT comparable to Section 3.1.2 of NEI 08-09, Revision 6. It also describes that the CSAT has the authority to conduct an independent assessment.

The submitted CSP describes that the CSAT will consist of individuals with knowledge about information and digital systems technology; NPP operations, engineering, and plant technical specifications; and physical security and emergency preparedness systems and programs. The CSAT description in the CSP is comparable to Regulatory Position C.3.1.2 in RG 5.71.

The submitted CSP lists the roles and responsibilities for the CSAT which included performing and overseeing the cyber security assessment process; documenting key observations; evaluating information about cyber security threats and vulnerabilities; confirming information obtained during tabletop reviews, walk-downs, or electronic validation of CDAs; and identifying potential new cyber security controls.

This section of the CSP submitted by the licensee is comparable to Regulatory Position C.3.1.2 in RG 5.71 without deviation.

Based on the above, the NRC staff finds that the CSP adequately establishes the requirements, roles and responsibilities of the CSAT.

### 3.5 Identification of CDAs

The submitted CSP describes that the licensee will identify and document CDAs and critical systems (CSs), including a general description, the overall function, the overall consequences if

a compromise were to occur, and the security functional requirements or specifications as described in Section 3.1.3 of NEI 08-09, Revision 6, which is comparable to Regulatory Position C.3.1.3 of RG 5.71.

Based on the above, the NRC staff finds that the CSP adequately describes the process to identify CDAs.

### 3.6 Examination of Cyber Security Practices

The submitted CSP describes how the CSAT will examine and document the existing cyber security policies, procedures, and practices; existing cyber security controls; detailed descriptions of network and communication architectures (or network/communication architecture drawings); information on security devices; and any other information that may be helpful during the cyber security assessment process as described in Section 3.1.4 of NEI 08-09, Revision 6, which is comparable to Regulatory Position C.3.1.2 of RG 5.71. The examinations will include an analysis of the effectiveness of the existing Cyber Security Program and cyber security controls. The CSAT will document the collected cyber security information and the results of their examination of the collected information.

This section of the CSP submitted by the licensee is comparable to Regulatory Position C.3.1.2 in RG 5.71 without deviation.

Based on the above, the NRC staff finds that the CSP adequately describes the examination of cyber security practices.

### 3.7 Tabletop Reviews and Validation Testing

The submitted CSP describes tabletop reviews and validation testing, which confirm the direct and indirect connectivity of each CDA and identify direct and indirect pathways to CDAs. The CSP states that validation testing will be performed electronically or by physical walkdowns. The licensee's plan for tabletop reviews and validation testing is comparable to Section 3.1.5 of NEI 08-09, Revision 6, which is comparable to Regulatory Position C.3.1.4 of RG 5.71.

Based on the above, the NRC staff finds that the CSP adequately describes tabletop reviews and validation testing.

### 3.8 Mitigation of Vulnerabilities and Application of Cyber Security Controls

The submitted CSP describes the use of information collected during the cyber security assessment process (e.g., disposition of cyber security controls, defensive models, defensive strategy measures, site and corporate network architectures) to implement security controls in accordance with Section 3.1.6 of NEI 08-09, Revision 6, which is comparable to Regulatory Position C.3.3 and Appendix A.3.1.6 to RG 5.71. The CSP describes the process that will be applied in cases where security controls cannot be implemented.

The submitted CSP notes that before the licensee can implement security controls on a CDA, it will assess the potential for adverse impact in accordance with Section 3.1.6 of NEI 08-09, Rev. 6, which is comparable to Regulatory Position C.3.3 of RG 5.71.

Based on the above, the NRC staff finds that the CSP adequately describes mitigation of vulnerabilities and application of security controls.

### 3.9 Incorporating the Cyber Security Program into the Physical Protection Program

The submitted CSP states that the Cyber Security Program will be reviewed as a component of the Physical Security Program in accordance with the requirements of 10 CFR 73.55(m). This is comparable to Section 4.1 of NEI 08-09, Revision 6, which is comparable to Regulatory Position C.3.4 of RG 5.71.

This section of the CSP submitted by the licensee is comparable to Appendix A, Section A.3.2 in RG 5.71 without deviation.

Based on the above, the NRC staff finds that the CSP adequately describes review of the CSP as a component of the physical security program.

### 3.10 Cyber Security Controls

The submitted CSP describes how the technical, operational and management cyber security controls contained in Appendices D and E of NEI 08-09, Revision 6, that are comparable to Appendices B and C in RG 5.71, are evaluated and dispositioned based on site-specific conditions during all phases of the Cyber Security Program. The CSP describes that many security controls have actions that are required to be performed on specific frequencies and that the frequency of a security control is satisfied if the action is performed within 1.25 times the frequency specified in the control, as applied, and as measured from the previous performance of the action, as described in Section 4.2 of NEI 08-09, Revision 6.

This section of the CSP submitted by the licensee is comparable to Appendix A, Section A.3.1.6 in RG 5.71, without deviation.

Based on the above, the NRC staff finds that the CSP adequately describes implementation of cyber security controls.

### 3.11 Defense-in-Depth Protective Strategies

The submitted CSP describes the implementation of defensive strategies that ensure the capability to detect, respond to, and recover from a cyber attack. The CSP specifies that the defensive strategies consist of security controls, defense-in-depth measures, and the defensive architecture. The submitted CSP notes that the defensive architecture establishes the logical and physical boundaries to control the data transfer between these boundaries.

The licensee established defense-in-depth strategies by implementing and documenting: a defensive architecture as described in Section 4.3 of NEI 08-09, Revision 6, which is comparable to Regulatory Position C.3.2 in RG 5.71; a physical security program, including physical barriers; the operational and management controls described in Appendix E of NEI 08-09, Revision 6, which is comparable to Appendix C to RG 5.71; and the technical

controls described in Appendix D of NEI 08-09, Revision 6, which is comparable to Appendix B to RG 5.71.

Bullet 4 of Section 6, "Defense-in-Depth" of Appendix E, "Operational and Management Cyber Security Controls" of the licensee's CSP includes a statement: "[d]ata flow from lower security levels to higher security levels is restricted between levels that are indirectly connected through a security boundary control device such as a firewall." The NRC staff requested the licensee to clarify the term "indirectly connected" and asked the licensee to provide examples and/or diagrams to support the explanation. The licensee responded by letter dated May 17, 2011 (ADAMS Accession No. ML11143A063). In Attachment 1 to this letter, the licensee stated that the word "indirectly" would be removed from the sentence. Based on the statement in the licensee's CSP, Section 4.3, which states, "[t]he boundary between Level 3 and Level 2 is implemented by (1) deterministically eliminating data flow from Level 2 to Level 3 or (2) restricting data flow and implementing network-based intrusion detection as described in Appendix D, Section 1.4, Information Flow Enhancement and Appendix E, Section 6, rule set characteristics," the NRC staff finds this clarification to be acceptable. This change was reflected in the CSP submitted as Attachment 2 of the May 17, 2011, letter.

This section of the CSP submitted by the licensee is comparable to Regulatory Position C.3.2 and Appendix A, Section A.3.1.5 in RG 5.71.

Based on the above, the NRC staff finds that the CSP adequately describes implementation of defense-in-depth protective strategies.

### 3.12 Ongoing Monitoring and Assessment

The submitted CSP describes how ongoing monitoring of cyber security controls to support CDAs is implemented comparable to Section 4.4 of NEI 08-09, Revision 6, which is comparable to Regulatory Positions C.4.1 and C.4.2 of RG 5.71. The ongoing monitoring program includes: configuration management and change control; cyber security impact analysis of changes and changed environments; ongoing assessments of cyber security controls; effectiveness analysis (to monitor and confirm that the cyber security controls are implemented correctly, operating as intended, and achieving the desired outcome) and vulnerability scans to identify new vulnerabilities that could affect the security posture of CDAs.

In the CSP Section 4.4.3.1, "Effectiveness Analysis," Dominion removed the phrase "and efficiency." The licensee justification provided states that, "[e]fficiency is not required by the Rule and will not necessarily be included in effectiveness analysis processes." NRC staff finds this deviation acceptable as it does not impact the cyber security program effectiveness.

In the CSP Section 4.4.3.2, "Vulnerability Scans," Dominion removed the phrase, "because of the potential for an adverse impact on SSEP functions." The licensee justification provided states that, "[t]here are conditions other than 'adverse impact on SSEP functions' when vulnerability scanning cannot be performed. This change will permit alternate controls to be used when these conditions exist." While scanning can add some value to the understanding of the current state of the licensee's network, the NRC staff considered that most commercial scanning tools do not understand vulnerabilities or protocols that may exist in an industrial control systems environment. In addition, the NRC staff has found that vulnerability

assessments are generally as effective in an industrial environment when it comes to discovering vulnerabilities as automated vulnerability scanning tools. The licensee stated that, "if vulnerability assessments or scanning cannot be performed on a production CDA, alternate controls are employed." The NRC staff considered that when vulnerability assessments or scanning cannot be performed, that alternative controls exist that would mitigate any existing or potentially undiscovered vulnerabilities. The NRC staff has reviewed this deviation and finds that applying alternate controls that are comparable in effectiveness to vulnerability assessments or vulnerability scanning, when these methods cannot be performed, is an acceptable method for meeting the intent of this section of the CSP.

This section of the CSP submitted by the licensee is comparable to Regulatory Positions C.4.1 and C.4.2 of RG 5.71.

Based on the above, the NRC staff finds that the CSP adequately describes ongoing monitoring and assessment.

### 3.13 Modification of Digital Assets

The submitted CSP describes how cyber security controls are established, implemented, and maintained to protect CDAs. These security controls ensure: that modifications to CDAs are evaluated before implementation; that the cyber security performance objectives are maintained; and that acquired CDAs have cyber security requirements in place to achieve the site's Cyber Security Program objectives. This is comparable to Section 4.5 of NEI 08-09, Revision 6, which is comparable to Appendices A.4.2.5 and A.4.2.6 of RG 5.71 without deviation.

Based on the above, the NRC staff finds that the CSP adequately describes modification of digital assets.

### 3.14 Attack Mitigation and Incident Response

The submitted CSP describes the process to ensure that SSEP functions are not adversely impacted due to cyber attacks, in accordance with Section 4.6 of NEI 08-09, Revision 6, which is comparable to Appendix C, Section C.8 of RG 5.71. The CSP includes a discussion about creating incident response policy and procedures, and addresses training, testing and drills, incident handling, incident monitoring, and incident response assistance. It also describes identification, detection, response, containment, eradication, and recovery activities comparable to Section 4.6 of NEI 08-09, Revision 6.

This section of the CSP submitted by the licensee is comparable to Appendix C, Section C.8 of RG 5.71, without deviation.

Based on the above, the NRC staff finds that the CSP adequately describes attack mitigation and incident response.

### 3.15 Cyber Security Contingency Plan

The submitted CSP describes creation of a Cyber Security Contingency Plan and policy that protects CDAs from the adverse impacts of a cyber attack described in Section 4.7 of NEI 08-09,



Revision 6, which is comparable to Regulatory Position C.3.3.2.7 and Appendix C.9 of RG 5.71. The licensee describes the Cyber Security Contingency Plan that would include the response to events. The plan includes procedures for operating CDAs in a contingency, roles and responsibilities of responders, processes and procedures for backup and storage of information, logical diagrams of network connectivity, current configuration information, and personnel lists for authorized access to CDAs.

This section of the CSP submitted by the licensee is comparable to Regulatory Position C.3.3.2.7 of RG 5.71, without deviation.

Based on the above, the NRC staff finds that the CSP adequately describes the cyber security contingency plan.

### 3.16 Cyber Security Training and Awareness

The submitted CSP describes establishment of training necessary for the licensee's personnel and contractors to perform their assigned duties and responsibilities in implementing the Cyber Security Program in accordance with Section 4.8 of NEI 08-09, Revision 6, which is comparable to Regulatory Position C.3.3.2.8 of RG 5.71.

The CSP states that individuals will be trained with a level of cyber security knowledge commensurate with their assigned responsibilities in order to provide high assurance that individuals are able to perform their job functions in accordance with Appendix E of NEI 08-09, Revision 6, which is comparable to Regulatory Position C.3.3.2.8 of RG 5.71 and describes three levels of training: awareness training, technical training, and specialized cyber security training.

Based on the above, the NRC staff finds that the CSP adequately describes the cyber security training and awareness.

### 3.17 Evaluate and Manage Cyber Risk

The submitted CSP describes how cyber risk is evaluated and managed utilizing programs and procedures comparable to Section 4.9 of NEI 08-09, Revision 6, which is comparable to Regulatory Position C.4 and Appendix C, Section C.13 of RG 5.71. The CSP describes Threat and Vulnerability Management, Risk Mitigation, the Operational Experience Program; and the Corrective Action Program and how each will be used to evaluate and manage risk.

In the CSP Section 4.9.1, "Threat and Vulnerability Management," Dominion replaced, "computer and control systems" with "CDA." The NRC staff finds this change acceptable since there are computer and control systems that are not CDAs and the requirements in 10 CFR 73.54(c)(1) are that the licensee protect CDAs.

This section of the CSP submitted by the licensee is comparable to Regulatory Position C.4 and Appendix C, Section C.13 of RG 5.71.

Based on the above, the NRC staff finds that the CSP adequately describes evaluation and management of cyber risk.

### 3.18 Policies and Implementing Procedures

The CSP describes development and implementation of policies and procedures to meet security control objectives in accordance with Section 4.10 of NEI 08-09, Revision 6, which is comparable to Regulatory Position C.3.5 and Appendix A, Section A.3.3 of RG 5.71. This includes the process to document, review, approve, issue, use, and revise policies and procedures.

The CSP also describes the licensee's procedures to establish specific responsibilities for positions described in Section 4.11 of NEI 08-09, Revision 6, which is comparable to Appendix C, Section C.10.10 of RG 5.71.

This section of the CSP submitted by the licensee is comparable to Regulatory Position C.3.5, Appendix A, Section A.3.3, and Appendix C, Section C.10.10 of RG 5.71, without deviation.

Based on the above, the NRC staff finds that the CSP adequately describes cyber security policies and implementing procedures.

### 3.19 Roles and Responsibilities

The submitted CSP describes the roles and responsibilities for the qualified and experienced personnel, including the Cyber Security Program Sponsor, the Cyber Security Program Manager, Cyber Security Specialists, the Cyber Security Incident Response Team (CSIRT), and other positions, as needed. The CSIRT initiates in accordance with the Incident Response Plan, takes action when required to safeguard CDAs from cyber security compromise, and assists with the eventual recovery of compromised systems. Implementing procedures establish the roles and responsibilities for each of the cyber security positions in accordance with Section 4.11 of NEI 08-09, Revision 6, which is comparable to Regulatory Position C.3.1.2, Appendix A, Section A.3.1.2, and Appendix C, Section C.10.10 of RG 5.71.

Based on the above, the NRC staff finds that the CSP adequately describes cyber security roles and responsibilities.

### 3.20 Cyber Security Program Review

The submitted CSP describes how the Cyber Security Program establishes the necessary procedures to implement reviews of applicable program elements in accordance with Section 4.12 of NEI 08-09, Revision 6, which is comparable to Regulatory Position C.4.3 and Appendix A, Section A.4.3 of RG 5.71.

Based on the above, the NRC staff finds that the CSP adequately describes the Cyber Security Program review.

### 3.21 Document Control and Records Retention and Handling

The submitted CSP describes that the licensee has established the necessary procedures to ensure that sufficient records of items and activities affecting cyber security are developed,

reviewed, approved, issued, and used, to reflect completed work. The CSP described that superseded portions of certain records will be retained for at least 3 years after the record is superseded, while audit records will be retained for no less than 12 months in accordance with Section 4.13 of NEI 08-09, Revision 6. However, this guidance provided by industry to licensees did not fully comply with the requirements of 10 CFR 73.54.

In a letter dated February 28, 2011,<sup>7</sup> NEI sent to the NRC proposed language for licensees' use to respond to the generic records retention issue, to which the NRC had no technical objection.<sup>8</sup> The proposed language clarified the requirement by providing examples (without providing an all-inclusive list) of the records and supporting technical documentation that are needed to satisfy the requirements of 10 CFR 73.54. All records will be retained until the Commission terminates the license, and the licensee shall maintain superseded portions of these records for at least three years after the record is superseded, unless otherwise specified by the Commission. By retaining accurate and complete records and technical documentation until the license is terminated, inspectors, auditors, or assessors will have the ability to evaluate incidents, events, and other activities that are related to any of the cyber security elements described, referenced, and contained within the licensee's NRC-approved CSP. It will also allow the licensee to maintain the ability to detect and respond to cyber attacks in a timely manner. In a letter dated April 4, 2011, the licensee responded to the records retention issue using the language proposed by NEI in its letter dated February 28, 2011.

Based on the above, the NRC staff finds that the language the licensee proposes to adopt provides for adequate records retention and will support the licensee's ability to detect and respond to cyber attacks. The NRC staff further finds that this section is comparable to Regulatory Position C.5 and Appendix A, Section A.5 of RG 5.71 without deviation. Accordingly, the NRC staff concludes that the licensee's CSP adequately describes cyber security document control and records retention and handling.

### 3.22 Implementation Schedule

The submitted CSP provides a proposed implementation schedule for the Cyber Security Program. In a letter dated February 28, 2011,<sup>9</sup> NEI sent to the NRC a template for licensees to use to submit their CSP implementation schedules, to which the NRC had no technical objection.<sup>10</sup> These key milestones are:

- Establish the CSAT;
- Identify CSs and CDAs;
- Install a deterministic one-way device between lower level devices and higher level devices;
- Implement the security control "Access Control For Portable And Mobile Devices";

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<sup>7</sup> ADAMS Accession No. ML110600204.

<sup>8</sup> Letter from NRC dated March 1, 2011, ADAMS Accession No. ML110490337.

<sup>9</sup> ADAMS Accession No. ML110600206.

<sup>10</sup> Letter from NRC dated March 1, 2011, ADAMS Accession No. ML110070348.

- Implement observation and identification of obvious cyber related tampering to existing insider mitigation rounds by incorporating the appropriate elements;
- Identify, document, and implement cyber security controls as per "Mitigation of Vulnerabilities and Application of Cyber Security Controls" for CDAs that could adversely impact the design function of physical security target set equipment; and
- Commence ongoing monitoring and assessment activities for those target set CDAs for which security controls have been implemented.

In a letter dated April 4, 2011, the licensee provided a revised implementation schedule using the NEI template, with the exception of Milestone 6. The licensee deviated from the template for Milestone 6 to address only the NEI 08-09, Revision 6, Appendix D, technical controls, excluding the operational and management controls, on the basis that implementing the technical controls for target set CDAs provides a high degree of protection against cyber-related attacks that could lead to radiological sabotage. Furthermore, the licensee's programs that are currently in place (e.g., physical protection, maintenance and work management, configuration management, operational experience, etc.) provide a high degree of protection during the interim period until such time that the full cyber security program is implemented.

The NRC staff acknowledges that, in its submittal dated April 4, 2011, the licensee proposed several CSP milestone implementation dates as regulatory commitments. The NRC staff does not regard the CSP milestone implementation dates as regulatory commitments that can be changed unilaterally by the licensee, particularly in light of the regulatory requirement 10 CFR 73.54, that "[i]mplementation of the licensee's cyber security program must be consistent with the approved schedule." As the NRC staff explained in its letter to all operating reactor licensees dated May 9, 2011,<sup>11</sup> the implementation of the plan, including the key intermediate milestone dates and the full implementation date, shall be in accordance with the implementation schedule submitted by the licensee and approved by the NRC. All subsequent changes to the NRC-approved CSP implementation schedule, thus, will require prior NRC approval pursuant to 10 CFR 50.90.

The NRC staff considers this April 4, 2011, supplement to be the approved schedule as required by 10 CFR 73.54. Based on the provided schedule ensuring timely implementation of those protective measures that provide a higher degree of protection against radiological sabotage, the NRC staff finds the Cyber Security Program implementation schedule is satisfactory.

### 3.23 Revision to License Conditions for Millstone

By letter dated July 12, 2010, the licensees proposed to add a paragraph to their respective Renewed Operating Licenses as follows:

- 1 – Paragraph 2.C.(4) of Renewed Facility Operating License No. DPR-65 for Millstone Power Station Unit No. 2

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<sup>11</sup> ADAMS Accession No. ML110980538.

2 – Paragraph 2.E of Renewed Facility Operating License No. NPF-49 for Millstone Power Station Unit No. 3

respectively, to provide a license condition to require each licensee to fully implement and maintain in effect all provisions of the NRC-approved CSP. By letter dated August 4, 2011, the licensee agreed with the revised license condition proposed by the NRC staff.

The following paragraphs are added to the affected Paragraphs of the Renewed Facility Operating Licenses:

1 – to Paragraph 2.C.(4) of Renewed Facility Operating License No. DPR-65 for Millstone Power Station Unit No. 2

The licensee shall fully implement and maintain in effect all provisions of the Commission-approved Kewaunee, Millstone, North Anna, and Surry Power Stations Cyber Security Plan (CSP), including changes made pursuant to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The CSP was approved by License Amendment No. XXX.

2 – to Paragraph 2.E of Renewed Facility Operating License No. NPF-49 for Millstone Power Station Unit No. 3

The licensee shall fully implement and maintain in effect all provisions of the Commission-approved Kewaunee, Millstone, North Anna, and Surry Power Stations Cyber Security Plan (CSP), including changes made pursuant to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The CSP was approved by License Amendment No. XXX.

As noted in Section 1.0 of this Safety Evaluation, the license amendment for Kewaunee, North Anna, and Surry was reviewed separately.

Based on the information in Section 3.0 of this Safety Evaluation and the modified license condition described above, the NRC concludes these changes are acceptable.

#### 4.0 DIFFERENCES FROM NEI 08-09, REVISION 6

In addition to the table of deviations found in Enclosure 1, Attachment 3 of the licensee's CSP, the NRC staff notes the following additional differences between the licensee's submission and NEI 08-09, Revision 6:

- In Section 3.1, "Scope and Purpose," the licensee clarified the definition of important-to-safety functions, consistent with SRM-COMWCO-10-0001.
- In Section 3.21, "Document Control and Records Retention and Handling," the licensee clarified the definition of records and supporting documentation that will be retained to conform to the requirements of 10 CFR 73.54.

- In Section 3.22, "Implementation Schedule," the licensee submitted a revised implementation schedule, specifying the interim milestones and the final implementation date, including supporting rationale. The licensee deviated from the template for Milestone 6 to address only the NEI 08-09, Revision 6, Appendix D technical controls.

The NRC staff finds all of these deviations to be acceptable as discussed in the respective sections.

## 5.0 STATE CONSULTATION

In accordance with the Commission regulations, the Connecticut state official was notified of the proposed issuance of the amendments. The official had no comments.

## 6.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding published in the *Federal Register* (76 FR 5616).

Also, these amendments relate to safeguards matters and do not involve any significant construction impacts, and relate to changes in recordkeeping, reporting, or administrative procedures or requirements. Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9), (10), and (12). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

## 7.0 CONCLUSION

The NRC staff's review and evaluation of the licensee's CSP was conducted using the NRC staff positions established in the relevant sections of RG 5.71. Based on the NRC staff's review, the NRC finds that the licensee addressed the relevant information necessary to satisfy the requirements of 10 CFR 73.54, 10 CFR 73.55(a)(1), 10 CFR 73.55(b)(8), and 10 CFR 73.55(m), as applicable and that the licensee's Cyber Security Program provides high assurance that CDAs are adequately protected against cyber attacks, up to and including the design-basis threat (DBT), as described in 10 CFR 7.3.1. This includes protecting digital computer and communication systems and networks associated with: (i) safety-related and important-to-safety functions; (ii) security functions; (iii) emergency preparedness functions including offsite communications; and (iv) support systems and equipment that, if compromised, would adversely impact SSEP functions.

Therefore, the NRC staff finds the information contained in this CSP to be acceptable and upon successful implementation of this program, operation of the Millstone Power Station, Units 2 and 3, will not be inimical to the common defense and security.

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) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

## 8.0 REFERENCES

1. RG 5.71, "Cyber Security Programs for Nuclear Facilities," U.S. Nuclear Regulatory Commission, Washington, DC, January 2010. (ADAMS Accession No. ML090340159)
2. Letter from Jack Roe, Nuclear Energy Institute, to Scott Morris, U.S. Nuclear Regulatory Commission, "NEI 08-09, Revision 6, 'Cyber Security Plan for Nuclear Power Reactors; April 2010,'" April 28, 2010. (ADAMS Accession No. ML101180434)
3. Letter from Richard Correia, U.S. Nuclear Regulatory Commission, to Jack Roe, Nuclear Energy Institute, "Nuclear Energy Institute 08-09, 'Cyber Security Plan Template, Revision 6,'" May 5, 2010. (ADAMS Accession No. ML101190371)
4. SRM-COMWCO-10-0001, "Regulation of Cyber Security at Nuclear Power Plants," October 21, 2010. (ADAMS Accession No. ML102940009)

Principal Contributors: P. Pederson, NSIR  
M. Coflin, NSIR

Date of issuance: September 30, 2011

September 30, 2011

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

SUBJECT: MILLSTONE POWER STATION UNITS 2 AND 3 - ISSUANCE OF  
AMENDMENTS RE: CYBER SECURITY PLAN (TAC NOS. ME4320 AND  
ME4321)

Dear Mr. Heacock:

The Nuclear Regulatory Commission has issued the enclosed amendments:

Amendment No. 309 to Renewed Facility Operating License No. DPR-65 for Millstone Power Station Unit 2, revising License Condition 2.C.(4)

Amendment No. 251 to Renewed Facility Operating License No. NPF-49 for Millstone Power Station Unit 3, revising License Condition 2.E

The amendments consist of changes to the operating licenses in response to your application dated July 12, 2010, as supplemented by letters dated August 5, 2010, September 23, 2010, November 10, 2010, December 13, 2010, April 4, 2011, May 17, 2011, and August 4, 2011.

The amendments approve the Cyber Security Plan (CSP) and associated implementation schedule for the nuclear plants named above, and revise the license condition regarding physical protection for each nuclear unit to reflect such approval. The amendments specify that the licensee fully implement and maintain in effect all provisions of the Commission-approved CSP as required by 10 CFR 73.54.

A copy of the NRC staff's related safety evaluation is also enclosed. A Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

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

Enclosures:

1. Amendment No. 309 to DPR-65
2. Amendment No. 251 to NPF-49
3. Safety Evaluation

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**ADAMS Accession No.: ML112031083**

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DATE	7/19/11	7/25/11	9/26/11	9/28/2011	9/30/2011

\*Safety evaluation transmitted by memo of 6/23/11 and revised by e-mail of 7/11/11 (ML111920050) .

OFFICIAL RECORD COPY





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

October 20, 2011

LICENSEES: SEE ENCLOSURE 1

FACILITIES: SEE ENCLOSURE 1

SUBJECT: SUMMARY OF OCTOBER 7, 2011, MEETING WITH BEYOND NUCLEAR REGARDING THEIR 10 CFR 2.206 PETITION TO SUSPEND OPERATING LICENSES (OLs) OF GENERAL ELECTRIC (GE) MARK I BOILING WATER REACTORS (BWRs) (TAC NO. ME6040)

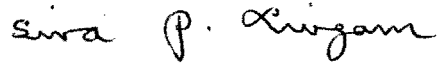
On October 7, 2011, a Category 3 public meeting was held between the U.S. Nuclear Regulatory Commission (NRC) and representatives of the Beyond Nuclear at NRC Headquarters, One White Flint North, 11555 Rockville Pike, Rockville, Maryland. The list of attendees is provided as Enclosure 2.

On April 13, 2011, Mr. Paul Gunter and Mr. Kevin Kamps representing Beyond Nuclear, hereafter called as the petitioners, submitted a petition pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 2.206 regarding the suspension of OLs of GE Mark 1 BWRs. The petitioners addressed the NRC Petition Review Board (PRB) on June 8, 2011. The PRB recommendations were transmitted to the petitioners by e-mail on August 16, 2011. The purpose of the October 7, 2011, meeting was to provide the petitioners a second opportunity to address the NRC PRB.

As described in Management Directive 8.11, "Review Process for 10 CFR 2.206 Petitions," the petitioners are provided the second opportunity to address the PRB in order to provide any relevant additional explanation and support for the petition in advance of the PRB's final evaluation. The meeting was recorded by the NRC's Operations Center and transcribed by a court reporter. The transcript is provided as Enclosure 3.

Members of the public were in attendance by teleconference. Public Meeting Feedback forms were not received.

Please direct any inquiries to me at 301-415-1564, or at [Siva.Lingam@nrc.gov](mailto:Siva.Lingam@nrc.gov).



Siva P. Lingam, Project Manager  
Plant Licensing Branch II-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-259, 50-260, 50-296,  
50-325, 50-324, 50-298,  
50-237, 50-249, 50-331,  
50-341, 50-333, 50-321,  
50-366, 50-354, 50-263,  
50-245, 50-220, 50-219,  
50-277, 50-278, 50-293,  
50-254, 50-265, and 50-271

Enclosures:

1. List of Licensees and Facilities
2. List of Attendees
3. Transcript

cc w/encls:

Mr. Paul Gunter, Director  
Reactor Oversight Project  
Beyond Nuclear  
6930 Carroll Avenue  
Suite 400  
Takoma Park, MD 20912

Mr. Kevin Kamps, Director  
Nuclear Waste Specialist  
Beyond Nuclear  
6930 Carroll Avenue  
Suite 400  
Takoma Park, MD 20912

Additional Distribution via Listserv

OCTOBER 7, 2011

LIST OF LICENSEES AND FACILITIES

10 CFR 2.206 PETITION SECOND PUBLIC MEETING

BEYOND NUCLEAR

PRESENTATION BEFORE THE NRC PETITION REVIEW BOARD

<u>Licensee</u>	<u>Facility</u>
Tennessee Valley Authority	Browns Ferry 1, 2 and 3
Progress Energy	Brunswick 1 and 2
Nebraska Public Power District	Cooper 1
Exelon Corporation, LLC	Dresden 2 and 3
FPL Group, Inc.	Duane Arnold 1
Detroit Edison Company	Fermi 2
Entergy Nuclear Operations, Inc.	Fitzpatrick 1
Southern Nuclear Operating Company	Hatch 1 and 2
PSEG Nuclear, LLC	Hope Creek 1
Northern Power States Company	Monticello 1
Dominion Generation	Millstone 1 (decommissioned)
Constellation Energy	Nine Mile Point 1
Exelon Corporation, LLC	Oyster Creek 1
Exelon Corporation, LLC	Peach Bottom 2 and 3
Entergy Nuclear Operations, Inc.	Pilgrim 1
Exelon Corporation, LLC	Quad Cities 1 and 2
Entergy Nuclear Operations, Inc.	Vermont Yankee 1

OCTOBER 7, 2011

LIST OF ATTENDEES

10 CFR 2.206 PETITION SECOND PUBLIC MEETING

BEYOND NUCLEAR

PRESENTATION BEFORE THE NRC PETITION REVIEW BOARD (PRB)

Beyond Nuclear (Petitioners)

Paul Gunter  
Kevin Kamps

Co-petitioners

Dale Bridenbaugh (Retired Nuclear Engineer) (by phone)  
Arnie Gundersen (Fairewinds Associates) (by phone)  
Deborah Katz (Citizens Awareness Network) (by phone)  
Louis Zeller (Blue Ridge Environmental Defense League) (by phone))  
Randy Kehler (Safe and Green Energy Campaign) (by phone)  
Michael Mariotte (Nuclear Information and Resource Service)  
Bobbie Paul (Georgia Women's Action for New Direction) (by phone)

NRC

Robert Nelson  
Merrilee Banic  
Michael Clark  
Siva P. Lingam  
Sam Miranda  
Vijay Goel  
Edward Smith  
Kamal Manoly  
Tanya Mensah  
Lauren Gibson  
Ron Albert

NRC (By Phone)

MeI Gray (Region 1)  
Harold Christensen (Region 2)  
David Hills (Region 3)  
Tom Farnholtz (Region 4)

Scientech, CWFC

Jana Bergman

AREVA

David K. White

GE Hitachi Nuclear Energy

Patricia Campbell

Nuclear Information and Resource Service

Dominique French

Please direct any inquiries to me at 301-415-1564, or at [Siva.Lingam@nrc.gov](mailto:Siva.Lingam@nrc.gov).

**/RA/**

Siva P. Lingam, Project Manager  
Plant Licensing Branch II-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-259, 50-260, 50-296,  
50-325, 50-324, 50-298,  
50-237, 50-249, 50-331,  
50-341, 50-333, 50-321,  
50-366, 50-354, 50-263,  
50-245, 50-220, 50-219,  
50-277, 50-278, 50-293,  
50-254, 50-265, and 50-271

**Enclosures:**

1. List of Licensees and Facilities
2. List of Attendees
3. Transcript

cc w/encls:

Mr. Paul Gunter, Director  
Reactor Oversight Project  
Beyond Nuclear  
6930 Carroll Avenue  
Suite 400  
Takoma Park, MD 20912

Mr. Kevin Kamps, Director  
Nuclear Waste Specialist  
Beyond Nuclear  
6930 Carroll Avenue  
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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PA 19406-1415

November 10, 2011

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  
05000336/2011004 AND 05000423/2011004

Dear Mr. Heacock:

On September 30, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Millstone Power Station Unit 2 and Unit 3. The enclosed inspection report documents the inspection results, which were discussed on October 12, 2011, with Mr. A. J. Jordan 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.

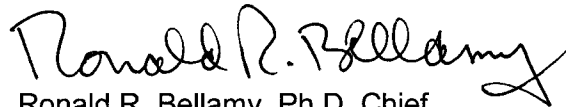
This report documents one self-revealing finding of very low safety significance (Green). This finding was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because it is entered into your corrective action program, the NRC is treating this finding as a non-cited violation (NCV) consistent with Section 2.3.2.a of the NRC 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 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 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.

D. Heacock

2

In accordance with Title 10 of the Code of Federal Regulations (CFR) Part 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 Web Site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,



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

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

Enclosure: Inspection Report No. 05000336/2011004 and 05000423/2011004  
w/Attachment: Supplemental Information

cc w/encl: Distribution via Listserv

D. Heacock

2

In accordance with Title 10 of the Code of Federal Regulations (CFR) Part 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 Web Site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

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

Distribution w/encl:

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D. Lew, DRA  
D. Roberts, DRP  
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C. Kowalyszyn, OA  
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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.: 05000336/2011004 and 05000423/2011004

Licensee: Dominion Nuclear Connecticut, Inc.

Facility: Millstone Power Station, Units 2 and 3

Location: P. O. Box 128  
Waterford, CT 06385

Dates: July 1, 2011 through September 30, 2011

Inspectors: S. Shaffer, Senior Resident Inspector, Division of Reactor Projects (DRP)  
J. Krafty, Resident Inspector, DRP  
B. Haagensen, Resident Inspector, DRP  
T. Moslak, Health Physicist, Division of Reactor Safety (DRS)  
C. Crisden, Emergency Preparedness Specialist, DRS  
N. McNamara, State Liaison Officer, Office of the Regional Administrator  
D. Silk, Senior Operations Engineer, DRS  
B. Fuller, Operations Engineer, DRS

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

Enclosure

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## SUMMARY OF FINDINGS

IR 05000336/2011004, 05000423/2011004; 07/01/2011 – 09/30/2011; Millstone Power Station Unit 2 and Unit 3; Refueling and Other Outage Activities.

The report covered a three-month period of inspection by resident and region-based inspectors. One Green finding, which was a non-cited violation (NCV), 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." The cross-cutting aspect was determined using IMC 0310, "Components within the Cross Cutting Areas." Findings for which the significance determination process (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. A self-revealing NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified for Dominion's failure to properly electrically isolate service water (SW) flanged joints of dissimilar metals. This caused a more rapid corrosion rate when a defect occurred in the lining of the carbon steel pipe and eventually led to a SW leak. On September 3, 2011, Dominion was forced to shut down Unit 2 when the spool leaked in excess of the limit allowed in authorized relief from American Society of Mechanical Engineers (ASME) code requirements. Dominion repaired the spool and electrically isolated the flanged joint. Dominion entered this issue into their corrective action program (CAP) CR441302.

The finding is more than minor because it is associated with the Human Performance 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. The finding was of very low safety significance (Green) because the finding was not a design or qualification deficiency that did not result in loss of operability, did not represent an actual loss of system safety function, did not represent an actual loss of safety function of a single train for greater than its technical specification (TS) allowed outage time, did not represent an actual loss of safety function of one or more non-technical specification trains of equipment designated as risk significant per 10 CFR 50.65, and did not screen as risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors determined that this finding had a cross-cutting aspect in the Human Performance cross-cutting area, Work Practices component, because Dominion personnel proceeded in the face of uncertainty and/or unexpected circumstances when they had difficulty installing the isolating sleeves in the flanged joint. [H.4(a)] (Section 71111.20)

## REPORT DETAILS

### Summary of Plant Status

Millstone Units 2 and 3 began the inspection period operating at 100 percent power. On August 27, 2011, Unit 2 reduced power to 50 percent and Unit 3 reduced power to 70 percent prior to the arrival of Hurricane Irene on August 28. During the storm, Unit 3 reduced power to 55 percent due to problems with condenser backpressure. Unit 2 returned to 100 percent power on August 29, and Unit 3 returned to 100 percent on August 30. Unit 2 entered a forced shutdown on September 3, to fix a service water leak on the 'A' header and returned to 100 percent power on September 19.

### 1. REACTOR SAFETY

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

1R01 Adverse Weather Protection (71111.01 - 1 sample)

#### Impending Adverse Weather

##### a. Inspection Scope

The inspectors evaluated Dominion's preparations for Hurricane Irene on August 26. The inspectors reviewed Dominion's UFSAR and procedures to determine the plant areas most likely to be affected by the hurricane force winds and storm surge and verified that actions recommended by the procedures could reasonably be completed. The inspectors spoke with supervision and determined actions were being taken to remove or secure potential missile hazards, additional personnel were being scheduled into the site, and that fatigue restrictions were considered in their planning. The inspectors also walked down the site in order to verify that the potential missile hazards were being addressed. Documents reviewed for each section of this inspection report are listed in the Attachment

##### b. Findings

No findings were identified.

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1R04 Equipment Alignment (71111.04 - 5 samples)Partial System Walkdownsa. Inspection Scope

The inspectors performed five partial system walkdowns during this inspection period. The inspectors reviewed the documents listed in the Attachment to determine the correct system alignment. The inspectors performed a walkdown of each system to determine if the critical portions of the selected systems were correctly aligned, in accordance with the procedures, and to identify any discrepancies that may have had an effect on operability. The walkdowns included selected switch and valve position checks, and verification of electrical power to critical components. Finally, the inspectors evaluated other elements, such as material condition, housekeeping, and component labeling. The following systems were reviewed based on their risk significance for the given plant configuration:

Unit 2

- 'B' Spent Fuel Pool Cooling when the 'A' train was out of service (OOS) for maintenance on September 1, 2011
- 'B' SW header when the 'A' train was OOS for a spool replacement on September 7, 2011

Unit 3

- 'B' Instrument Air Compressor (IAC) when the 'A' IAC was OOS for maintenance on July 28
- 'A' High Pressure Safety Injection (SI) when the 'B' train of SI was OOS for maintenance on July 28
- 'A' Recirculation Spray System (RSS) when the 'B' train of RSS was OOS for maintenance on July 29

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05Q – 6 samples)a. Inspection Scope

The inspectors performed walkdowns of six fire protection areas. The inspectors reviewed Dominion's fire protection program to determine the required fire protection design features, fire area boundaries, and combustible loading requirements for the selected areas. The inspectors walked down these areas to assess Dominion's control of transient combustible material and ignition sources. In addition, the inspectors evaluated the material condition and operational status of fire detection and suppression

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capabilities, fire barriers, and any related compensatory measures. The inspectors compared the existing conditions of the areas to the fire protection program requirements to determine if all program requirements were being met. The fire protection areas reviewed included:

Unit 2

- Enclosure Building, Fire Area E-1
- 'B' Emergency Diesel Generator (EDG), Fire Area A-16
- DC Switchgear, Fire Area T-1
- West 480V Load Center, Fire Area T-6

Unit 3

- Fire Pump House, Fire Area FP-1
- 'A' EDG, Fire Area EG-3

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.7A – 1 sample)

a. Inspection Scope

The inspectors observed the as-found condition of the 3EGS\*E1A ('A' EDG air cooler) and E2A ('A' EDG jacket water cooler) heat exchanger after it was noted to be approaching the ALERT level in performance monitoring. The inspectors reviewed the results of the inspections against the acceptance criteria contained within the procedure to determine whether all acceptance criteria had been satisfied. The inspectors also reviewed the UFSAR to ensure that heat exchanger inspection results were consistent with the design basis and reviewed the test criteria to ensure the performance test was appropriate for the type of service.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11).1 Resident Inspector Quarterly Review (71111.11Q – 2 samples)a. Inspection Scope

The inspectors observed simulator-based licensed operator requalification training for Unit 2 on August 24 and for Unit 3 on August 23. The inspectors evaluated crew performance in the areas of clarity and formality of communications; ability to take timely actions; prioritization, interpretation, and verification of alarms; procedure use; control board manipulations; oversight and direction from supervisors; and command and control. Crew performance in these areas was compared to Dominion management expectations and guidelines as presented in TR-AA-730, "Licensed Operator Biennial and Annual Operating Requalification Exam Process," Revision 3. The inspectors compared simulator configurations with actual control board configurations. The inspectors also observed Dominion evaluators discuss identified weaknesses with the crew and/or individual crew members, as appropriate.

b. Findings

No findings were identified.

.2 Licensed Operator Requalification (71111.11B – 1 sample)a. Inspection Scope

Inspection activities were performed using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 9, Supplement 1, Inspection Procedure Attachment 71111.11, "Licensed Operator Requalification Program," Appendix A, "Checklist for Evaluating Facility Testing Material," and Appendix B, "Suggested Interview Topics."

A review was conducted of recent operating history documentation found in inspection reports, Dominion's corrective action program, and the most recent NRC plant issues matrix (PIM). The inspectors also reviewed specific events from Dominion's corrective action program which indicated possible training deficiencies, to verify that they had been appropriately addressed. The NRC senior resident inspector was also consulted for insights regarding licensed operators' performance. These reviews did not detect any operational events that were indicative of possible training deficiencies.

The operating tests for the week of August 29, 2011, were reviewed for quality and performance. On September 29, 2011, the results of the annual operating tests for year 2011 for Millstone Unit 2 and Unit 3 were reviewed to determine if pass fail rates were consistent with the guidance of NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 9, Supplement 1, and NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process (SDP)." (The biennial written examinations were not

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administered this year). The review verified the following:

### Unit 2

- Crew pass rates were greater than 80 percent. (Pass rate was 90.4 percent)
- Individual pass rates on the dynamic simulator test were greater than 80 percent. (Pass rate was 90.0 percent)
- Individual pass rates on the job performance measures of the operating exam were greater than 80 percent. (Pass rate was 96.0 percent)
- More than 75 percent of the individuals passed all portions of the exam. (84.0 percent of the individuals passed all portions of the operating examination)

### Unit 3

- Crew pass rates were greater than 80 percent. (Pass rate was 100 percent)
- Individual pass rates on the dynamic simulator test were greater than 80 percent. (Pass rate was 100 percent)
- Individual pass rates on the job performance measures of the operating exam were greater than 80 percent. (Pass rate was 100 percent)
- More than 75 percent of the individuals passed all portions of the exam. (100 percent of the individuals passed all portions of the operating examination)

Observations were made of the dynamic simulator exams and job performance measures administered during the week of August 29, 2011, to Shift 'A'. These observations included facility evaluations of crew and individual performance during the dynamic simulator exams and individual performance of five JPMs.

The remediation plans for a crew/individual's failure and a written failure were reviewed to assess the effectiveness of the remedial training. Two senior reactor operator license activations were reviewed to ensure that 10 CFR 55.53 license conditions and applicable program requirements were met.

Operators, instructors, and training/operation's management were interviewed for feedback on their training program and the quality of training received. Simulator performance and fidelity were reviewed for conformance to the reference plant control room. A sample of records for requalification training attendance, program feedback, reporting, and medical examinations were reviewed for compliance with license conditions, including NRC regulations.

b. Findings

No findings were identified.

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1R12 Maintenance Effectiveness (71111.12Q – 2 samples)a. Inspection Scope

The inspectors reviewed two samples of Dominion's evaluation of degraded conditions, involving safety-related structures, systems and/or components for maintenance effectiveness during this inspection period. The inspectors reviewed Dominion's implementation of the "Maintenance Rule," 10 CFR 50.65. The inspectors reviewed Dominion's ability to identify and address common cause failures, the applicable maintenance rule scoping document for each system, the current classification of these systems in accordance with 10 CFR 50.65 (a)(1) or (a)(2), and the adequacy of the performance criteria and goals established for each system, as appropriate. The inspectors also reviewed recent system health reports, Condition Reports (CR), apparent cause determinations, functional failure determinations, operating logs, and discussed system performance with the responsible system engineer.

The specific systems/components reviewed were:

Unit 2

- Periodic (a)(3) Evaluation dated May 19, 2011; and
- Foxboro SPEC 200 Racks.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 7 samples)a. Inspection Scope

The inspectors evaluated online risk management for emergent and planned activities. The inspectors reviewed maintenance risk evaluations, work schedules, and control room logs to determine if concurrent planned and emergent maintenance or surveillance activities adversely affected the plant risk already incurred with OOS components. The inspectors evaluated whether Dominion took the necessary steps to control work activities, minimize the probability of initiating events, and maintain the functional capability of mitigating systems. The inspectors assessed Dominion's risk management actions during plant walkdowns. The inspectors reviewed the conduct and adequacy of risk assessments for the following maintenance and testing activities:

Unit 2

- Green risk on August 1 with the station blackout (SBO) diesel, Reactor Building component cooling water (RBCCW), and SI OOS due to electrical bus outages;
- High trip risk on August 19 associated with replacement of ZT-5269, 'B' feedwater regulating valve position transmitter;
- Yellow risk on September 6 with the plant in mode 5 and the 'A' SW header OOS to replace a leaking 10 inch spool piece

Unit 3

- Emergent work on August 1 for the TDAFW pump for steam leakage past AOV31A/B and 'D'
- Emergent work on August 11 repairing a Freon leak on 3VHQ\*ACUS1B Train 'B' ESF support air conditioner;
- Green risk on August 17, power reduction to support work on 3DSM\*E1B, RSS System PMs, ESF Ground water sump and protection set #4; and
- Green risk on August 31, for replacement of RWST level switches for DC MP3-11-01008, Refueling Water Storage Tank Level Switch Upgrade.

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15 – 11 samples)a. Inspection Scope

The inspectors reviewed eleven operability determinations (ODs). The inspectors evaluated the ODs against the guidance contained in NRC Regulatory Issue Summary 2005-20, Revision to Guidance Formerly Contained in NRC Generic Letter 91-18, "Information to Licensees Regarding Two NRC Inspection Manual Sections on Resolution of Degraded and Nonconforming Conditions and on Operability." The inspectors also discussed the conditions with operators and system and design engineers, as necessary. The inspectors reviewed the adequacy of the following evaluations of degraded or non-conforming conditions:

Unit 2

- RAS 000182, which covers an extension to the allowed TRM time limit for compensatory cooling to the West 480 volt switchgear room
- OD000428, Control Room Air Conditioning System, Z1 Train, degraded condition due to excess oil
- OD000214, Nitrogen leak on the #3 safety injection tank (SIT)
- OD000436, SW leak on spool SK-2952, SW to the 'A' EDG
- CR434798, MP2 EDG SW discharge common header structural integrity

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- OD000281, Westinghouse non conservative error in Millstone 2 LOCA containment analysis
- CR442835, 2-RC-402 (PORV) did not stroke during performance of SP 2610M, and an engineering technical review paper demonstrating full design compliance

### Unit 3

- CR438375, 3HVR\*FN5, Aux Building Ventilation / SLCRs Operability
- CR438239, EDG Belleville Washers - installed non-safety grade material
- RAS for CR437419, Gamma Metric Wide Range Logarithmic Neutron Flux Accident Monitors
- ODM000192, 'D' RCP Seal Leakoff

#### b. Findings

No findings were identified.

### 1R18 Plant Modifications (71111.18 – 1 sample)

#### a. Inspection Scope

The inspectors assessed the adequacy of modification MP3-11-01008, Refueling Water Storage Tank Level Switch Upgrade. The inspectors performed walkdowns of selected plant systems and components, interviewed plant staff, and reviewed applicable documents, including procedures, calculations, modification packages, engineering evaluations, drawings, corrective action program documents, the UFSAR, and TS. The inspectors determined whether selected attributes (component safety classification, energy requirements supplied by supporting systems, seismic qualification, instrument setpoints, uncertainty calculations, electrical coordination, electrical loads analysis, and equipment environmental qualification) were consistent with the design and licensing bases. Design assumptions were reviewed to verify that they were technically appropriate and consistent with the UFSAR. For each modification, the 10 CFR 50.59 screenings or safety evaluations were reviewed. The inspectors also verified that procedures, calculations, and the UFSAR were properly updated with revised design information. In addition, the inspectors verified that the as-built configuration was accurately reflected in the design documentation and that post-modification testing was adequate to ensure the structures, systems, and components would function properly.

#### b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 6 samples)a. Inspection Scope

The inspectors reviewed post-maintenance test (PMT) activities to determine whether the PMT adequately demonstrated that the safety-related function of the equipment was satisfied, given the scope of the work specified, and that operability of the system was restored. In addition, the inspectors evaluated the applicable test acceptance criteria to evaluate consistency with the associated design and licensing bases, as well as TS requirements. The inspectors also evaluated whether conditions adverse to quality were entered into the corrective action program for resolution. The following maintenance activities and PMTs were evaluated:

Unit 2

- SP 2411, "CEA Motion Inhibit Verification (OL, OOS, PDIL) Functional Test Data," Revision 002-08 following replacement of the CPU battery
- SP 2610BO-002, "TDAFP and Recirculation Check Valve IST," Revision 000-05 following replacement of bearing oil sight glass and valves on the suction line and pump vent
- Magnetic particle examination and visual examination of the butt weld on the flange replacement on the 10 inch SW line to the 'A' EDG
- SP 2604P-001, "ESF Equipment Response Times," Revision 012-01 following replacement of 2-FW-51B ('B' feed water regulating valve) positioned
- SP21238, "RCS Leak Test," Revision 005-00 following replacement of 'C' RCP pump seal

Unit 3

- SP 3441E01, "Gamma-Metric Neutron Flux/Shutdown Margin Monitor Channel Calibration," Revision 011-01 PMT for Gamma Metrics Channel 2 Repairs

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 – 1 sample)Millstone Unit 2 Forced Outagea. Inspection Scope

On September 3, 2011, Millstone Unit 2 conducted a plant shutdown and entered a forced outage to repair a SW leak on the 'A' header. The inspectors reviewed the shutdown risk in order to verify that the unavailable 'A' SW header was properly protected when assessing plant risk. The inspectors observed portions of the shutdown and subsequent startup and power ascension evolutions. The inspectors verified that

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conditions adverse to quality discovered during the outage were entered into Dominion's CAP for resolution.

b. Findings

Introduction. A self-revealing Green NCV of 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified for Dominion's failure to properly electrically isolate service water (SW) flanged joints of dissimilar metals. Specifically, several of the electrically isolating sleeves for the studs were damaged when assembling the flanges joining the ten inch carbon steel SW spool piece to the AL-6XN spool piece. This caused a more rapid corrosion rate when a defect occurred in the lining of the carbon steel pipe. This eventually led to a SW leak and a forced plant shutdown.

Description. On August 17, 2011, Millstone Unit 2 operators identified a through wall leak on the flange of SK-2952, which is a 10 inch PVC lined carbon steel SW spool piece. The carbon steel spool was bolted to SK-2951A, an AL-6XN spool piece. This portion of the SW system provides SW to the 'A' EDG and could not be isolated from the 'A' SW header during operation. Dominion performed ultrasonic testing (UT) of the flange and determined that the defect was localized between two of the bolt holes on the flange. Dominion's assessment was that structural integrity was maintained and asked for relief from ASME code requirements which was verbally granted for a period of four months on August 20, 2011. On September 3, 2011, the leak increased from approximately 6 ml/minute to 15 gallon/minute, and the unit was shut down as required by the conditions of the authorized relief.

Upon disassembling the system for repairs, Dominion discovered that several of the electrically isolating sleeves for the studs were damaged upon removal from the dissimilar metal flanged joint. Dominion concluded that the sleeves were damaged due to improper installation. An October 2009 work order ( 53102198311) replaced the existing plastic lined carbon steel spool SK-2951A with an AL-6XN spool. Included in the work order was drawing 25203-20150, Sheet 471, "'A' Train Service Water Supply to Diesel Engine Coolers," Revision 0, which specified installing an isolation kit consisting of plastic or phenolic washers and sleeves with the fasteners. Electrically isolating the carbon steel flange from the AL-6XN flange is necessary to prevent accelerated galvanic corrosion of the carbon steel spool piece should a defect occur in the plastic lining. The inspectors concluded that the damaged isolating sleeves caused accelerated corrosion of the carbon steel spool and resulted in a failure of the spool piece earlier than expected. Dominion repaired the spool, properly installed the electrical isolation kits in the dissimilar metal flanged joint, and returned the component to service.

Analysis. The inspectors determined that the failure to properly install the isolating sleeves on all the studs for the ten inch SW spool was a performance deficiency that 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, impacts on the NRC's ability to perform its regulatory function, or willful aspects of the finding. The inspectors performed a review of IMC 0612, Appendix E,

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“Examples of Minor Issues,” and determined that the performance deficiency was not similar to any of the examples. The inspectors determined that the finding was more than minor because it is associated with the Human Performance 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.

The inspectors conducted a Phase 1 screening in accordance with NRC Inspection Manual Chapter (IMC) Attachment 0609.04, “Phase 1 – Initial Screening and Characterization of Findings,” and determined that the finding was of very low safety significance (Green) because the finding was not a design or qualification deficiency that did not result in loss of operability, did not represent an actual loss of system safety function, did not represent an actual loss of safety function of a single train for greater than its TS allowed outage time, did not represent an actual loss of safety function of one or more non-technical specification trains of equipment designated as risk significant per 10 CFR 50.65, and did not screen as risk significant due to a seismic, flooding, or severe weather initiating event.

The inspectors determined that this finding had a cross-cutting aspect in the Human Performance cross-cutting area, Work Practices component, because Dominion personnel proceeded in the face of uncertainty and/or unexpected circumstances when they had difficulty installing the isolating sleeves in the flanged joint. [H.4(a)]

Enforcement. 10 CFR 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” requires, in part, that activities affecting quality shall be prescribed by instructions, procedures, or drawings of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Contrary to the above, on October 20, 2009, Dominion did not properly electrically isolate the joint joining the AL-6XN spool piece to the carbon steel spool piece when they damaged several of the isolating sleeves for the studs upon installation into the flanges. Dominion took corrective action to repair the spool and electrically isolate the flanged joint when the spool leaked in excess of the limit allowed in authorized relief from ASME code requirements. Because this finding was of very low safety significance (Green) and has been entered into Dominion’s corrective action program (CR441302), this violation is being treated as an NCV, consistent with the NRC Enforcement Policy. **(NCV 05000336/2011004-01, Failure to Electrically Isolate a Dissimilar Metal Flanged Joint Leads to Forced Shutdown Due to Service Water Leak)**

1R22 Surveillance Testing (71111.22 – 5 samples)a. Inspection Scope

The inspectors reviewed surveillance activities to determine whether the testing adequately demonstrated equipment operational readiness and the ability to perform the intended safety-related function. The inspectors attended pre-job briefings, reviewed selected prerequisites and precautions to determine if they were met, and observed the tests to determine whether they were performed in accordance with the procedural steps. Additionally, the inspectors reviewed the applicable test acceptance criteria to evaluate consistency with associated design bases, licensing bases, and TS requirements and that the applicable acceptance criteria were satisfied. The inspectors also evaluated whether conditions adverse to quality were entered into the corrective action program for resolution. The following surveillance activities were evaluated:

Unit 2

- SP 2605G-005, "RM-8123A/B CIV Stroke and Timing IST," Revision 003-05 (CIV)

Unit 3

- SP 3646A.8-010, "Containment Isolation Phase A S920 – Relay K630, Slave Relay Actuation," Revision 002 (CIV)
- SP-3464A.1, "'A' EDG Sequencer Start and Operability Test," Revision 018-05
- SP-3622.2, "'B' MD Auxiliary Feedwater Pump (AFW) Pump Operational Test," Revision 016-02
- SP-3441E01, "Gamma-Metric Neutron Flux/Shutdown Margin Monitor Channel Calibration

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness (EP)**1EP2 Alert and Notification System (ANS) Evaluation (71114.02 - 1 sample)a. Inspection Scope

Since the last program inspection, Millstone Power Station replaced their ANS with a new system that was activated in July 2010. An onsite review was conducted to assess the maintenance and testing of the new system. During this inspection, the inspectors interviewed EP staff responsible for implementation of the ANS testing and maintenance programs. CRs pertaining to the ANS were reviewed for causes, trends, and corrective actions. In addition, the inspectors observed a monthly activation test of the sirens located in the Town of East Lyme from the 911 Dispatch Center and interviewed those employees responsible for conducting the test and for activating the system during an

actual emergency. The inspectors reviewed the associated ANS procedures and the FEMA-approved ANS Design Report to ensure Dominion's compliance with design report commitments for system maintenance and testing. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment .02. Planning Standard, 10 CFR 50.47(b) (5) and the related requirements of 10 CFR 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

1EP3 Emergency Response Organization (ERO) Staffing and Augmentation System  
(71114.03 - 1 sample)

a. Inspection Scope

The inspectors performed a review of Millstone's ERO augmentation staffing requirements and the process for notifying and augmenting the ERO. The review was performed to ensure the readiness of key licensee staff to respond to an emergency event and to ensure Dominion's ability to activate their emergency response facilities in a timely manner. The inspectors reviewed the Millstone Emergency Plan, duty roster, and augmentation reports. The inspectors also reviewed a sampling of ERO responder's training records to ensure training and qualifications were up to date. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 3. Planning Standard, 10 CFR 50.47(b)(2) and related requirements of 10 CFR 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

1EP4 Emergency Action Level (EAL) and Emergency Plan Changes (71114.04 - 1 sample)

a. Inspection Scope

Since the last NRC inspection of this program area, in October 2010, Dominion implemented various revisions to the Millstone Emergency Plan. Dominion had determined that, in accordance with 10 CFR 50.54(q), these changes made to the Plan, and its lower-tier implementing procedures, had not resulted in any decrease in 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 50. The inspectors reviewed all EAL changes and a sample of emergency plan changes, including the changes to lower-tier emergency plan implementing procedures, for any potential decreases in effectiveness of the Millstone Emergency Plan for the period of September 2010 to July 2011. However, this review by the inspectors was not documented in an NRC Safety Evaluation Report and does not constitute formal NRC approval of the changes. Therefore, these changes remain subject to future NRC inspection in their entirety. The

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inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 4. The requirements in 10 CFR 50.54(q) were used as reference criteria.

b. Findings

No findings were identified.

1EP5 Correction of Emergency Preparedness Weaknesses (71114.05 - 1 sample)

a. Inspection Scope

The inspectors reviewed a sampling of drill reports, two 10 CFR 50.54(t) audit reports and a self-assessment report to assess Dominion's ability to evaluate their EP performance and program. The inspectors reviewed a sampling of CRs initiated from September 2009 through July 2011 by Dominion at Millstone from drills, self-assessments, and audits. This inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 5, Planning Standard, 10 CFR 50.47(b)(14) and the related requirements of 10 CFR 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06 – 1 sample)

a. Inspection Scope

The inspectors reviewed the operator's emergency classification and notification completed during Unit 3's requalification training on August 23. The inspectors verified the event classification and notification were accurate and timely.

b. Findings

No findings were identified.

## 2. RADIATION SAFETY

### Cornerstone: Public and Occupational Radiation Safety

2RS07 Radiological Environmental Monitoring Program (REMP) (71124.07 - 1 sample)

#### a. Inspection Scope

During the period August 22 - 25, 2011, the inspectors conducted the following activities to verify that Dominion implemented the radiological environmental monitoring program (REMP) consistent with the TSs and the Off-Site Dose Calculation Manual (ODCM) to validate that radioactive effluent releases met the design objectives of Appendix I to 10 CFR Part 50.

This inspection activity represents completion of one sample relative to this inspection area, completing the biennial requirement.

The inspectors reviewed the 2009 and 2010 Annual Radiological Environmental Operating Reports and the 2010 REMP Land Use Census Report to verify that the environmental monitoring programs were implemented as required by the ODCM.

The inspectors walked down eight air sampling stations (Nos. 1-I, 2-I, 3-I, 4-I, 10-I, 11-I, 15-C, 27-I), one seawater sampling station (No.32-I), one oyster harvesting station (No. 31-I ), and twenty (of 40) thermoluminescent (TLD) monitoring stations. The inspectors determined that sampling was conducted as described in the ODCM related procedures, and evaluated the sampling equipment material condition. The inspectors confirmed that the air sampling locations were in areas having high X/Q and D/Q wind sectors, and the TLDs were located in areas with the highest potential for public exposure.

As part of the walk down, the inspectors observed the technician collecting and prepare for analysis air particulate/iodine filter samples, oyster, and water samples, and verified that environmental sampling was representative of the release pathways, as specified in the ODCM, and that sampling techniques were in accordance with procedures.

Based on direct observation and review of records, the inspectors verified that the meteorological instrumentation was operable, calibrated, and maintained in accordance with the guidance contained in the FSAR, NRC Safety Guide 23, and with Dominion procedures. The inspectors verified that the meteorological data readout and recording instruments in the control room and at the tower were operable for wind direction, wind speed, air temperature, and delta temperature. The inspectors confirmed that redundant instrumentation was available and that the annualized recovery rate for meteorological data was greater than 90 percent. The inspectors reviewed the calibration/maintenance records for eight air samplers and verified that the air flow calibration equipment was currently calibrated.

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The inspectors reviewed CRs and Nuclear Oversight field observation reports and audit, relevant to the REMP requirements, to evaluate the threshold for which issues are entered into the corrective action program, the adequacy of subsequent evaluations, and the effectiveness of the resolution. The inspectors' reviewed monthly RETS/ODCM effluent occurrence reports to evaluate the adequacy and timeliness of performance indicator information.

The inspectors reviewed the quarterly results of Dominion's inter-laboratory comparison program to verify the accuracy of their environmental air filter, charcoal cartridge, water, biota, and milk sample analyses. Additionally, the inspectors reviewed the annual quality assurance audit of Dominion's vendor providing environmental analytical services.

The inspectors reviewed changes made by Dominion to the ODCM as a result of changes to the land use census or sampler station modifications since the last inspection. The inspectors also reviewed technical justifications for any change in sampling location (or frequency) and verified that Dominion performed the reviews required to ensure that the changes did not affect its ability to monitor the radiological condition of the environment.

The inspectors confirmed that Dominion is implementing an onsite groundwater sampling and monitoring program sufficient to detect leakage from plant systems, structures and components. Included in this review was an evaluation of potential leakage from the Unit 3 refueling water storage tank, various radiological waste storage tanks, and foundation sumps.

b. Findings

No findings were identified.

**4. OTHER ACTIVITIES [OA]**

4OA1 Performance Indicator (PI) Verification (71151)

.1 Cornerstone: Emergency Preparedness (3 samples)

a. Inspection Scope

The inspectors reviewed data for Emergency Preparedness PIs listed below. The last NRC EP inspection at Millstone was conducted in the fourth quarter of 2010, so the inspectors reviewed supporting documentation from EP drills, training records, and equipment tests from the fourth calendar quarter of 2010 through the second quarter of 2011, 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 Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guidelines," Revision 6.

Enclosure

- Drill and Exercise Performance
- ERO Drill Participation
- ANS Reliability

b. Findings

No findings were identified.

.2 Cornerstone: Mitigating Systems (10 samples)

a. Inspection Scope

The inspectors reviewed Dominion submittals for the PIs listed below to verify the accuracy of the data reported during that period. The PI definitions and guidance contained in NEI 99-02 were used to verify the basis for reporting each data element. The inspectors reviewed portions of the operations logs, monthly operating reports, and LERs and discussed the methods for compiling and reporting the PIs with cognizant licensing and engineering personnel.

Unit 2

- Mitigating System Performance Index (MSPI) High Pressure Safety Injection (HPSI) System
- MSPI AFW System
- MSPI Emergency AC Power System
- MSPI Residual Heat Removal (RHR) System
- MSPI Support Cooling Water System

Unit 3

- Mitigating System Performance Index (MSPI) High Pressure Safety Injection (HPSI) System
- MSPI AFW System
- MSPI Emergency AC Power System
- MSPI Residual Heat Removal (RHR) System
- MSPI Support Cooling Water System

b. Findings

No findings were identified.

.3 RETS/ODCM Radiological Effluent Occurrences (1 sample)

a. Inspection Scope

The inspector reviewed relevant effluent release reports for the period October 2010 through July 2011, for issues related to the public radiation safety performance indicator as specified in NEI 99-02. The NEI criteria for reporting performance indicator includes radiological effluent release occurrences that exceed 1.5 mrem/qtr whole body or 5.0 mrem/qtr organ dose for liquid effluents; 5mrads/qtr gamma air dose, 10 mrad/qtr beta air dose, and 7.5 mrads/qtr for organ dose for gaseous effluents. This inspection activity represents the completion of one sample relative to this inspection area; completing the annual inspection requirements.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Review of Items Entered into the Corrective Action Program

a. Inspection Scope

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into Dominion's corrective action program. This was accomplished by reviewing the description of each new CR and attending daily management review committee meetings.

b. Findings

No findings were identified.

.2 Annual Sample-Operator Workarounds (2 samples)

a. Inspection Scope

The inspectors performed an in-depth review of Unit 2 and Unit 3 workarounds. The inspectors reviewed the operations aggregate impact database (OPSTAT) and procedure, and interviewed operations personnel in order to determine if deficiencies affecting operators were being appropriately characterized and prioritized.

b. Findings and Observations

No findings were identified.

The inspectors determined that, in general, conditions that had a negative impact on shift operations were being entered into the OPSTAT database and evaluated. However, Unit 2 standing order, SO-11-011, which imposed additional operator actions in the event of a plant downpower, due to the second stage MSR reheat low load valves possibly not closing as required when in an automatic mode, had not been entered in to the OPSTAT database.

In addition, the inspectors identified that deficiencies identified as control panel issues on both units are not considered as control room deficiencies per the OPSTAT database instructions although they appear to fit the definition in OP-AA-1700, "Operations Aggregate Impact." Operations had been following a previous site procedure deviated from the fleet procedure requirement by not including control panel deficiencies in the OPSTAT database and Operator Work Around performance indicator. Dominion entered this issue into their corrective action program, CR446133, and promptly corrected the problem.

4OA3 Event Follow-up (71153 – 2 samples)

.1 (Closed) LER 05000336/2011-002 Reactor Trip on Low Steam Generator Level

a. Inspection Scope

On June 20, 2011, Millstone Unit 2 was at 59 percent power when the reactor automatically tripped on low SG level. Unit 2 had reduced power to 30 percent in order to repair an oil leak on the 'C' reactor coolant pump. Following the repair, operators began increasing power to return to 100 percent. At the time of the trip, the operators were in the process of placing the second feedwater pump in service. The recirculation flow from the second feedwater pump back to the condenser caused the running feedwater pump to trip on low suction pressure. The loss of feedwater flow to the SG caused the levels to lower until the reactor tripped on low SG level.

b. Findings

This issue was previously documented in NRC Inspection Report 05000336/2011003 as a Green finding. The LER was reviewed and no additional findings were identified. This LER is closed.

.2 Event Response to Hurricane Irene

a. Inspection Scope

On August 27, 2011, Millstone Unit 2 and Unit 3 reduced power to 50 percent and 70 percent respectively in anticipation of Hurricane Irene arriving on shore. Prior to the

onset of tropical force winds, NRC inspectors completed IP 71111.01, "Impending Adverse Weather," to ensure the site was prepared for hurricane force winds and the potential storm surge. During the storm, NRC inspectors staffed the control rooms of both units from the onset of tropical storm winds until the storm had passed. Following the storm, the NRC inspectors conducted a walkdown and damage assessment of both units. Unit 2 returned to 100 percent power on August 29 and Unit 3 returned to 100 percent power on August 30.

b. Findings and Observations

No findings were identified.

During the storm, Unit 3 experienced a loss of condenser backpressure in the 'A' condenser bay and manually tripped the 'A' CW pump prior to exceeding the trip set point. The Unit 3 control room operators entered AOP 3575, "Rapid Downpower," and successfully conducted a power reduction to 55 percent. During the storm, numerous grid instabilities occurred but both units stayed on line, in Mode 1 until the storm had passed. The loss of the Flanders service line resulted in loss of house power to numerous administrative buildings that were not in the power block and to Unit 1. The site lost normal telephone service, access to the Dominion LAN and Internet, and non-safety systems powered from this service line. The meteorological tower and backup meteorological tower did not provide meteorological parameters during the storm due to a loss of electrical power. The plant safety systems were not degraded. The newly installed emergency notification sirens were not significantly degraded as the battery backup power supplies maintained power to all sirens that had lost electrical line power. The post-storm damage assessment revealed no significant damage. All systems were restored by August 29, 2011.

4OA5 Other Activities – (1 sample)

Independent Spent Fuel Storage Installation (ISFSI) Monitoring Controls (60855.1)

a. Inspection Scope

The inspectors reviewed routine operations and monitoring of the ISFSI. The inspectors walked down the ISFSI to evaluate its material condition, performed independent dose rate measurements of the storage modules, and confirmed module temperatures were within the required limits. The inspectors also reviewed plant equipment operator logs for ISFSI surveillances and environmental (ISFSI) dosimetry records. Radiological control activities for the ISFSI were evaluated against 10 CFR Part 20, ISFSI TSs, and with Dominion's procedures.

b. Findings

No findings were identified.

40A6 Meetings, including Exit

Exit Meeting Summary

On October 12, 2011, the resident inspectors presented the overall inspection results to Mr. A. J. Jordan and members of his staff. The inspectors confirmed that no proprietary information was provided or examined during the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure



**SUPPLEMENTAL INFORMATION****KEY POINTS OF CONTACT**Dominion personnel

L. Armstrong	Manager, Training
G. Auria	Nuclear Chemistry Supervisor
B. Barron	Manager, Nuclear Oversight
B. Bartron	Supervisor, Licensing
T. Berger	Unit 3 Shift Manager
D. Burley	Unit 3 Control Room Supervisor
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
J. Cote	Unit 3 Control Operator
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
M. Galipeau	Unit 3 I&C Supervisor
A. Gharakhanian	Nuclear Engineer III
T. Gibson	Unit 3 Plant Equipment Operator
W. Gorman	Supervisor, Instrumentation & Control
J. Grogan	Supervisor, Nuclear Training
K. Grover	Manager, Nuclear Operations
C. Houska	I&C Technician
A. Jordan	Site Vice President
J. Kunze	Supervisor, Nuclear Operations Support
J. Laine	Manager, Radiation Protection/Chemistry
S. Lambert	Unit 3 Unit Supervisor
L. LeBaron	Nuclear Engineer III
B. Lepine	Unit 3 Plant Equipment Operator
M. Logan	I&C Technician
R. MacManus	Director, Nuclear Station Safety & Licensing
P. Malzahn	Supervisor Nuclear Operations Support
G. Marshall	Manager, Outage and Planning
M. Martell	Unit 3 Shift Manager
R. McDonald	Senior Instructor (Nuclear Operations)
M. Noniewcz	Unit 3 Control Operator
R. Peters	I&C Technician
B. Pinkowitz	Senior Instructor (Nuclear Operations)
T. Rigney	Emergency Preparedness Specialist IV

A-2

R. Riley	Supervisor, Nuclear Shift Operations Unit 3
M. Roche	Senior Nuclear Chemistry Technician
D. Rowe	Unit 3 Shift Manager
L. Salyards	Licensing, Nuclear Technology Specialist
M. Sartain	Director, Nuclear Engineering
M. Sebilus	Unit 3 Reactor Operator
J. Semancik	Plant Manager
P. Sikorsky	Unit 2 Shift Manager
A. Smith	Asset Management
D. Smith	Manager, Emergency Preparedness
S. Smith	Manager, Nuclear Site Engineering
J. Stoddard	Unit 3 Shift Manager
J. Spalter	Unit 3 Unit Supervisor
S. Turowski	Supervisor, Health Physics Technical Services
M. Vigneau	Unit 3 Shift Technical Advisor
C. Vournazos	IT Specialist, Meteorological Data
W. Woolery	Unit 2 Shift Manager

**LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**Opened and Closed

05000336/2011004-01      NCV      Failure to Electrically Isolate Dissimilar Metal Flanged Joint Leads to Forced Shutdown Due to Service Water Leak (Section 1R20)

Closed

05000336/2011-002      LER      Reactor Trip on Low Steam Generator Level (Section 4OA3)

**LIST OF DOCUMENTS REVIEWED****Section 1R01: Adverse Weather Protection**

AOP 2560, "Storms, Winds and High Tides," Revision 010-06  
AOP 3569, "Severe Weather Conditions," Revision 017-00

**Section 1R04: Equipment Alignment**

OP 2305-001, "Spent Fuel Pool Cooling," Revision 012-00  
OP 2326A-002, "Service Water Alignment Verification, Facility 2," Revision 000-04  
OP 3332A-001, "Instrument Air System – Valve Lineup," Revision 008-08  
OP 3332C-001, "Service Air System - Valve Lineup," Revision 008-03  
Spent Fuel Pool Cooling and Purification System Health Report, 2<sup>nd</sup> quarter 2011

**Section 1R05: Fire Protection**

Millstone Unit 2 Fire Hazards Analysis, Revision 9  
Millstone Unit 2 Firefighting Strategies, April 2002  
Millstone Unit 3 Fire Protection Evaluation Report  
Millstone Unit 3 Firefighting Strategies, April 2002

**Section 1R07: Heat Sink Performance**

EPRI NP-7552, "Heat Exchanger Performance Monitoring Guidelines," dated December 1991  
SP-3626.13, "SW Heat Exchanger Fouling Determination," Revision 020-08  
SP3626.13-002, "CCI and EGS Train 'A' Heat Exchanger Fouling Determination," Revision 016-05 data sheets for the dates January 3, 2011, April 25, 2011; May 2, 9, 16, 23, 30, 2011; June 6, 13, 20, 27, 2011; July 4, 11, 18, 25, 2011 and August 1, 2011  
CR436557, "EGS Train 'A' Heat Exchanger fouling is just below the Alert range," dated August 1, 2011  
CR330751, "HVR and EDG Debris Loading Curve Issues," dated April 13, 2009  
CR440220, "SW Fouling for 'A' EDG in ALERT range," dated August 29, 2011  
RAS CR 330751, "HVR and EGS Fouling Action Curve Issues"  
MRE010555, "HVR and EDG Debris Loading Curve Issues"  
System Health Report, EDG, 2<sup>nd</sup> Quarter 2011

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

AOE #5, "MP2 LORT annual Operating Exam," Revision 7/0  
TR-AA-730, "Licensed Operator Biennial and Annual Operating Requalification Exam Process,"  
Revision 3  
Licensed Operator Requalification Simulator Scenario SE62  
AOP 3575, "Rapid Downpower," Revision 017-05  
EOP 35 E-0, "Reactor Trip or Safety Injection," Revision 026-00  
EOP 35 E-1, "Loss of Reactor or Secondary Coolant," Revision 024-00  
EOP 35 E-3, "Steam Generator Tube Rupture," 023-00  
EOP 35 FRS.1, "Response to Nuclear Power Generation / ATWS," Revision 019-00  
EOP 35 FRZ.1, "Response to Containment High Pressure," Revision 016-02  
CR440209, "A '1' for Human performance was given during an evaluated simulator session,"  
dated August 26, 2011  
MP3 2010 Biennial Written Exam Analysis  
MP-14-OPS-GDL200, Conduct of Operations, Revision 12 (Superseded)  
MP-14-OPS-GDL401, Operations Department Work Control Guideline & Expectations, Revision  
2-2  
OP-AA-100, Conduct of Operations, Revision 14  
TIG-05, Operator Training Written Examinations, Revision 001  
TIG-06, Operator Licenses, Revision 000  
TR-AA-710, NRC Exam Security Requirements, Revision 2  
TPD-7.080, Licensed Operator Requalification Training, Revision 12  
TR-AA-730, Licensed Operator Biennial/Annual Operating Requalification Exam Process,  
Revision 3  
2010 LORT Annual Operating Test Sample Plan  
2011 LORT Annual Operating Test Sample Plan  
CR354048 CR395175  
CR371727 CR395524  
CR379359 CR397722  
CR382609 CR397853  
CR389653 CR407843  
CR392086 CR413602  
CR393099 CR416445  
CR393946 CR416485  
CR395024 CR438865  
CR395160

**Simulator Deficiency Reports**

DR2010-3-0055  
DR2010-3-0069  
DR2011-3-0054  
DR2011-3-0058

**Annual Simulator Testing Documents (2010)**

50% Steady State Operation  
75% Steady State Operation  
100% Steady State Operation

Transient Test 2, Simultaneous Trip of All Main Feedwater Pumps  
 Transient Test 3, Simultaneous Closure of All Main Steam Isolation Valves  
 Transient Test 5, Trip of Any Single Reactor Coolant Pump  
 Transient Test 9, Maximum Size Unisolable Main Steam Line Rupture  
 Transient Test 10, Slow RCS Depressurization to Saturated Conditions

**Section 1R12: Maintenance Effectiveness**

SAR001422, Formal Self-Assessment of the Millstone Maintenance Rule Program, dated May 19, 2011

Foxboro SPEC 200 Rack System Health Report, 2<sup>nd</sup> Quarter 2010 and 1<sup>st</sup> Quarter 2011

MRE011362	MRE013564
MRE011395	MRE013786
MRE011444	MRE013814
MRE011467	MRE013821
MRE013072	MRE013850
MRE013093	MRE013881

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

High Risk Contingency Plan for ZT-5269 'B' Feedwater Regulating Valve Position Transmitter

Trouble shooting plan for the TDAFW Pump steam leakage

OD (or ODM) for AFW condensate pump drainage

OP-3322, "Auxiliary Feedwater System," Revision 021-08

OU-M2-201, Attachment 1, "Millstone Unit 2 Shutdown Safety Assessment (SSA) Checklist," dated September 6, 2011

SP-3622.3, "AFW Pump 3FWA\*P2 Operational Readiness Test," Revision 017-03

Drawing 8600042, "AFW System – 004," Revision 2

WM-AA-301, Attachment 4, "Managing Medium Risk Significant Activities" for the August 16, 2011 Unit 3 down power for repairs to DSM pump and control valve

EOOS On-Line Risk Report for August 17, 2011

EOOS On-Line Risk report for August 31, 2011

CR436253, "23 Gallons received after draining the TDAFW pump steam supply standpipe," dated July 31, 2011

CR429530, "Minor refrigerant leak identified on 3HVQ\*ACUS1B," dated June 2, 2011

CR437134, "Freon Leak on 3VHQ\*ACUS1B," dated August 8, 2011

CR437692, "Re-evaluation of refrigerant leak on ESF air conditioner 3HVQ\*ACUS1B," dated August 11, 2011

CR437699, "Quantifying Refrigerant Leaks on ESF Air Conditioners," dated August 11, 2011

CR437906, "Lesson Learned from 3HVQ\*ACUS1B work," dated August 12, 2011

CR438136, "'B' MSR Drain Tank Level increased to High Level Dump Trip Setpoint," dated August 16, 2011

AWO 53102442156

AWO 53102450044

**Section 1R15: Operability Evaluations**

DOM-NAF-3, "GOTHIC Methodology for Analyzing the Response to Postulated Pipe Ruptures Inside Containment," Revision 0.0-P-A

MP2-LOE-129-EM, "Millstone Unit 2 Seismic (DBE) Structural Integrity Study of Underground Service Water Return Lines from EDG Coolers," Revision 0

SP 2610BO-001, "2-MS-201, 2-MS-202 and 2-MS-464 (SV-4188) Stroke and Timing IST,"  
 Revision 001-03  
 SP 2669A, "PEO Rounds," Revision 017-06  
 SP 2669A-002, "Unit 2 Aux Building Rounds," Revision 052  
 T-04438S2, "MP2 Issues with the Current LOCA Mass and Energy Releases and the Resulting  
 Short-term Containment Pressure Impacts," Revision 0  
 HVR088C, "Reactor Plant Ventilation," Revision 3.1  
 FSAR Section 6.2 and Figure 6.2-4  
 RAS for CR437419, "Unable to Adjust Power Range to within acceptance criteria in accordance  
 with SP3441E01," dated August 24, 2011  
 SP 3673.6, "Accident Monitoring Instrumentation," Revision 004-07  
 SP 3441E01, "Gamma-Metric Neutron Flux/Shutdown Margin Monitor Channel Calibration,"  
 Revision 011-01  
 SP 3441E01-001, "Gamma-Metric Neutron Flux Monitor / Shutdown Margin Monitor Channel 1  
 Calibration," Revision 008-05  
 SP 3441E01-002, "Gamma-Metric Neutron Flux Monitor / Shutdown Margin Monitor Channel 2  
 Calibration," Revision 008-05  
 SP 3441E01-003, "Gamma-Metric Neutron Flux Monitor Channel 1 at Power Calibration,"  
 Revision 008-003  
 SP 3441E01-004, "Gamma-Metric Neutron Flux Monitor Channel 2 at Power Calibration,"  
 Revision 008-003  
 WO53102336608, "SV, 18M – Gamma-metric Neutron Flux Monitor," Revision 0  
 WO53102237941, Gamma-metric Neutron Flux Monitor Channel Calibration (Perform at  
 Power), Revision 0  
 WO53102383229, "Calibration of Computer Points NME-DET1SR, DET1WR Following SAT 4  
 Replacement," Revision 0  
 WO53102383232, "Calibration of Computer Points NME-DET2SR, DET2WR Following SAT 4  
 Replacement," Revision 0  
 Instruction Manual No. 009, Neutron Flux Monitor  
 PHUPE, "Unit 3 Gamma-Metrics Surveillance (SP 3441E01) Calculation and Acceptance  
 Criteria Review Errors," dated September 13, 2011  
 ETE-MP-2011-0111, "MP3 Gamma-Metrics Channel Calibration SP3441E01 Bandpass Filter  
 Offset Voltage," dated September 23, 2011  
 MRE014175, "SENG – Discovered as left data for Gamma Metrics channel 2 out of acceptance  
 criteria," dated September 10, 2011  
 DCR M3-08027, "SPU – Impact of Radiological accident Doses," Revision 0  
 ODM000170 "Operation of CHS\*FLT3A with 3CHS\*V368 failed open"  
 ODM000192 "'D' RCP Seal Leakoff Increasing"  
 CR365652  
 CR409418  
 CR434719  
 CR434743  
 CR434805  
 CR438239, "NSR parts installed in the Unit 3 emergency diesels contrary to current MEPL,"  
 dated August 17, 2011  
 CR438375, "3HVR\*FN5 did not stop when control switch was operated from VP1B," dated June  
 18, 2011  
 CR438377, "3HVR\*FN5 did not stop when switch was placed in STOP," dated June 18, 2011

CR438510, "ABB Breaker (32G 2-2) for M33HVR-FN5 Failed to Open," dated June 18, 2011  
 CR373596, "Channel 2 Gamma Metrics As Found Data Found Outside of Allowable Limits," dated March 25, 2010  
 CR437419, "Gamma-metric Neutron Flux Monitor Channel 1 Cannot Meet Acceptance Criteria," dated August 10, 2011  
 CR440582, "TRM 7.4.1a(3) requires a Functionality Assessment for Unit 3 Gamma-Metrics," dated August 8, 2011  
 CR442297, "Discovered as left data for Gamma Metrics channel 2 out of acceptance criteria," dated September 10, 2011  
 CR442336, "Calculated Acceptance Criteria for Gamma-Metrics Channel 1 was incorrect," dated September 10, 2011  
 CR443761, "Need to Measure Gamma-Metrics Channel 2 Bandpass Filter Offset Voltage," dated September 20, 2011  
 CR443771, "Need to Replace test Generator Cards in both trains of MP3 Gamma-Metrics," dated September 20, 2011  
 CR444051, "Change Bandpass Filter bias voltage tolerance on MP3 Gamma-Metrics Wide Range NI," dated September 21, 2011  
 CR444078, "Gamma-Metrics Ch 2 Band Pass Filter Voltage Found Outside of Acceptance Criteria," dated September 21, 2011  
 CR444512, "Procedure SP3441E01 Requires Corrections," dated September 24, 2011  
 CR444753, "SP3441E02 Requires a Procedure Change," dated September 26, 2011  
 CR444482, "Procedure Change SP3441E01 Gamma Metrics Wide Range NI Bandpass Filter Cal," dated September 24, 2011  
 CR444050, "ODM000170 (Operation of CHS\*FLT3A with 3CHS\*V368 failed open) needs to be re-evaluated because trigger value of 6 inches DP on 3CHS\*FLT3A," dated September 21, 2011  
 CR444601, "Trend of 'D' RCP #1 seal leakoff continues to increase showing seal degradation," dated September 25, 2011

**Section 1R18: Plant Modifications**

DC MP3-11-01008, "MPS RWST Level Switch Upgrade," Revision 5  
 SP3451B03, "RWST Level Switch (3QSS\*LS54A, 3QSS\*LS54C) and Pump (3RHS\*P1A) Interlock Channel Calibration," Revision 8  
 SP3451B04, "RWST Level Switch (3QSS\*LS54B, 3QSS\*LS54D) and Pump (3RHS\*P1B) Interlock Channel Calibration," Revision 4  
 SP3451B05, "RWST Level Switch (3QSS\*LS56A, 3QSS\*LS56C) and Pump (3QSS\*P3A) Interlock Channel Calibration," Revision 6  
 SP3451B06, "RWST Level Switch (3QSS\*LS56B, 3QSS\*LS56D) and Pump (3QSS\*P3B) Interlock Channel Calibration," Revision 5

**Section 1R19: Post Maintenance Testing**

SP 2411A, "CEA Motion Inhibit Verification, (deviation) Data Sheet," Revision 002-04  
 SP 2411B, "PDIL Alarm Verification sheet," Revision 000-04  
 SP 2604XS-011, "2-FW-51B Accumulator Test Data," Revision 000-01  
 RAS for CR437419, "Unable to Adjust Power Range to within acceptance criteria in accordance with SP3441E01," dated August 24, 2011  
 SP 3673.6, "Accident Monitoring Instrumentation," Revision 004-07

SP 3441E01, "Gamma-Metric Neutron Flux/Shutdown Margin Monitor Channel Calibration,"  
Revision 011-01  
SP 3441E01-001, "Gamma-Metric Neutron Flux Monitor / Shutdown Margin Monitor Channel 1  
Calibration," Revision 008-05  
SP 3441E01-002, "Gamma-Metric Neutron Flux Monitor / Shutdown Margin Monitor Channel 2  
Calibration," Revision 008-05  
SP 3441E01-003, "Gamma-Metric Neutron Flux Monitor Channel 1 at Power Calibration,"  
Revision 008-003  
SP 3441E01-004, "Gamma-Metric Neutron Flux Monitor Channel 2 at Power Calibration,"  
Revision 008-003  
Instruction Manual No. 009, Neutron Flux Monitor  
PHUPE, "Unit 3 Gamma-Metrics Surveillance (3441E01) Calculation and Acceptance Criteria  
Review Errors," dated September 13, 2011  
ETE-MP-2011-0111, "MP3 Gamma-Metrics Channel Calibration SP3441E01 Bandpass Filter  
Offset Voltage," dated September 23, 2011  
MRE014175, "SENG – Discovered as left data for Gamma Metrics channel 2 out of acceptance  
criteria," dated September 10, 2011  
53102336608, "SV, 18M – Gamma-metric Neutron Flux Monitor," Revision 0  
53102237941, "Gamma-metric Neutron Flux Monitor Channel Calibration" (Perform at Power),  
Revision 0  
53102383229, "Calibration of Computer Points NME-DET1SR, DET1WR Following SAT 4  
Replacement," Revision 0  
53102383232, "Calibration of Computer Points NME-DET2SR, DET2WR Following SAT 4  
Replacement," Revision 0  
53102295021  
53102307730  
53102375413  
53102394445  
53102438250  
53102450635  
53102457393  
53102461422  
CR373596, "Channel 2 Gamma Metrics As Found Data Found Outside of Allowable Limits,"  
dated March 25, 2010  
CR437419, "Gamma-metric Neutron Flux Monitor Channel 1 Cannot Meet Acceptance Criteria,"  
dated August 10, 2011  
CR440582, "TRM 7.4.1a(3) requires a Functionality Assessment for Unit 3 Gamma-Metrics,"  
dated August 8, 2011  
CR442297, "Discovered as left data for Gamma Metrics channel 2 out of acceptance criteria,"  
dated September 10, 2011  
CR442336, "Calculated Acceptance Criteria for Gamma-Metrics Channel 1 was incorrect,"  
dated September 10, 2011  
CR443761, "Need to Measure Gamma-Metrics Channel 2 Bandpass Filter Offset Voltage,"  
dated September 20, 2011  
CR443771, "Need to Replace test Generator Cards in both trains of MP3 Gamma-Metrics,"  
dated September 20, 2011  
CR444051, "Change Bandpass Filter bias voltage tolerance on MP3 Gamma-Metrics Wide  
Range NI," dated September 21, 2011



CR444078, "Gamma-Metrics Ch 2 Band Pass Filter Voltage Found Outside of Acceptance Criteria," dated September 21, 2011  
CR444512, "Procedure SP3441E01 Requires Corrections," dated September 24, 2011  
CR444753, "SP3441E02 Requires a Procedure Change," dated September 26, 2011  
CR444482, "Procedure Change SP3441E01 Gamma Metrics Wide Range NI Bandpass Filter Cal," dated September 24, 2011

**Section 1R20: Refueling and Other Outages**

OP 2202, "Reactor Startup ICCE," Revision 022-02  
OP 2204, "Load Changes," Revision 023-14  
OP 2206, "Reactor Shutdown," Revision 011-03  
CR441302  
CR441367  
CR441398  
CR441448

**Section 1R22: Surveillance Testing**

SP-3646A.1, "Emergency Diesel Generator 'A' Operability Test," Revision 018-05  
SP-3646A.1-001, "Emergency Diesel Generator 'A' Operability Tests," Revision 018-02  
SP 3622.2, "Auxiliary Feedwater Pump 3FWA\*P1B Operational Test," Revision 016-02  
SP 3622.2-001, "Auxiliary Feedwater Pump 3FWA\*P1B IST Group 'B' Pump Test," Revision 014-04  
SP 3441E01, "Gamma-Metric Neutron Flux/Shutdown Margin Monitor Channel Calibration," Revision 011-01  
SP 3441E01-001, "Gamma-Metric Neutron Flux Monitor / Shutdown Margin Monitor Channel 1 Calibration," Revision 008-05  
SP 3441E01-002, "Gamma-Metric Neutron Flux Monitor / Shutdown Margin Monitor Channel 2 Calibration," Revision 008-05  
CR437368, "'A' EDG out of spec reading on OP-3364-14," dated August 9, 2011  
CR 437331, "Sparking noted at outboard slip ring brushes on Unit 3 'A' Diesel Generator during PM," dated August 9, 2011  
CR437315, "'A' Rocker Arm oil level is < ¼ when diesel is running," dated August 9, 2011  
CR437993, "Packing leakage observed at 3FWA\*V984," dated August 15, 2011  
CR437998, "Packing leakage discovered at packing area of 3FWA\*V024," dated August 15, 2011  
CR443761, "Need to Measure Gamma-Metrics Channel 2 Bandpass Filter Offset Voltage," dated September 20, 2011  
CR443771, "Need to Replace test Generator Cards in both trains of MP3 Gamma-Metrics," dated September 20, 2011  
CR444051, "Change Bandpass Filter bias voltage tolerance on MP3 Gamma-Metrics Wide Range NI," dated September 21, 2011  
CR444078, "Gamma-Metrics Ch 2 Band Pass Filter Voltage Found Outside of Acceptance Criteria," dated September 21, 2011  
CR444512, "Procedure SP3441E01 Requires Corrections," dated September 24, 2011  
CR444753, "SP3441E02 Requires a Procedure Change," dated September 26, 2011  
CR444482, "Procedure Change SP3441E01 Gamma Metrics Wide Range NI Bandpass Filter Cal," dated September 24, 2011

**Section 1EP2: Alert and Notification System Evaluation**

FEMA REP-10 Design Report – Millstone Alert and Notification System, January 2010  
 MP-26-EPA-FAP08, Alert Notification System Administration, Revision 5  
 MP-26-EPA-FAP09, Alert Notification System Test and Maintenance, Revision 6  
 MP-26-EPA-FAP11, Public Alert System Siren Acoustical Performance Testing, Revision 0

**Condition Reports**

CR365815	CR399956
CR379996	CR400981
CR380252	CR405453
CR388347	CR425923
CR389490	CR426106
CR390406	CR429283
CR390409	CR434200
CR395661	CR436004

**Section 1EP3: Emergency Response Organization Staffing and Augmentation System**

Millstone Power Station Emergency Plan, Revision 43  
 MP-26-EPI-FAP07, Notifications and Communications, Revision 12  
 TR-MP-TPG-2400, Emergency Plan Training (EPLAN), Revision 23  
 MP-26-EPI-FAP07, Notifications and Communications, Revision 12  
 MP-26-EPA-FAP01, Management Program for Maintaining Emergency Preparedness, Revision 9  
 SERO Roster  
 TR-MP-TPG-2400, Millstone Power Station Emergency Plan Training (EPLAN), Revision 23  
 Monthly SERO Unannounced ENRS Call In Summary (Come-in), July 2011  
 Monthly SERO Unannounced ENRS Call In Summary, January 2010  
 Monthly SERO Unannounced ENRS Call In Summary, February 2010  
 Monthly SERO Unannounced ENRS Call In Summary, March 2011  
 Monthly SERO Unannounced ENRS Call In Summary, April 2011

**Section 1EP4: Emergency Action Level and Emergency Plan Changes**

EP-AA-101, 10 CFR 50.54 (q) Change Evaluation, Revision 3  
 EP-AA-601, Emergency Press Releases

**Change Evaluations**

MP-10-048, 10 CFR 50.54 (q) Program Evaluation Effectiveness Review, Revision 43 E-Plan Changes, December 2010  
 MP-11-003, 10 CFR 50.54 (q) Program Evaluation Effectiveness Review, Notification/Communications, January 2011  
 MP-10-033, 10 CFR 50.54(q) Program Evaluation Effectiveness Review, Fleet Initiative-Improve News Releases, November 2010  
 MP-10-043, 10 CFR 50.54 (q) Program Evaluation Effectiveness Review, Alert Notification System Test and Maintenance  
 MP-10-040, 10 CFR 50.54 (q) Program Evaluation Effectiveness Review, E-Plan Areva Lab Closure, November 2010  
 MP-10-047, 10 CFR 50.54 (q) Program Evaluation Effectiveness Review, Drill and Exercise Program, October 2010

**Section 1EP5: Correction of Emergency Preparedness Weaknesses**

PI-AA-200, Corrective Action, Revision 16  
 EP-AA-303, Equipment Important to Emergency Response, Revision 2  
 EP-AA-400, Drill and Exercise Program, Revision 1  
 Millstone Unit 2, Emergency Preparedness Evaluation, Unusual Event Declaration Final Report, November 15, 2009  
 Audit 11-02: Emergency Preparedness, April 13, 2011  
 Audit 10-02: Emergency Preparedness, April 22, 2010  
 Unit 1 and Environmental Sampling Training Drill, December 16, 2010  
 CFD 10-04, NRC/FEMA Evaluated Exercise Report, October 19, 2010  
 CFD 09-08, Unit 1 Tabletop Training Drill, December 10, 2009  
 CFD 09-04, Unit 3 SERO Training Drills

**Condition Reports**

CR 410507	CR 434933	CR 434933
CR 409805	CR 435266	CR 434939
CR 436242	CR 435031	CR 434938
CR 436074	CR 431001	CR 415922
CR 436021	CR 435101	
CR 436004	CR 416349	
CR 436003	CR 407829	
CR 434992	CR 412793	
CR 434991	CR 414970	

**Section 2RS07: Radiological Environmental Monitoring Program (REMP)**

**Procedures**

RPM 2.5.9, Dry Shielded Canister (DSC) Surveys (ISFSI)  
 RPM 1.3.9, Area Monitoring  
 MP-22-REC-BAP01, Radiological Effluent Monitoring – Site Dose Calculation Manual  
 MP-22-GWP-PRG, Groundwater Protection Program  
 REMP 1.1, Environmental Collection Schedule  
 REMP 1.2, Radiological Environmental Monitoring (REMP) Sampling & Analysis  
 REMP 1.3, Land Use Census  
 REMP 1.4, Quality Control of the Radiological Environmental Monitoring Program  
 REMP 1.5, Annual Radiological Environmental Operating Report  
 REMP 2.1, Sample Identification and Transmittal to the Contractor for Analysis  
 REMP 2.2, Environmental TLD Collection and Distribution  
 REMP 2.3, Airborne Particulate and Iodine Sampling  
 REMP 2.4, Soil Sampling  
 REMP 2.5, Milk Sampling  
 REMP 2.6, Terrestrial Biota Sampling  
 REMP 2.7, Terrestrial Water Sampling  
 REMP 2.8, Groundwater Sampling  
 ENV 2003, Aquatic Sampling for Radiological Environmental Monitoring Program  
 REMP 2.8, Groundwater Sampling  
 C SP 400.2/.3, Meteorological Tower Instruments (Primary/Backup) Calibration

Sampling Sites

Air Particulate/Iodine: 1-I, 2-I, 3-I, 4-I, 10-I, 11-I, 15-C, 27-I

Sea Water: Nos. 32-I

Oyster Sampling: No. 31-I

Thermoluminescent Dosimeters Nos. 1-I, 2-I, 3-I, 4-I, 5-I, 6-I, 7-I, 8-I, 9-I, 10-I, 11-I, 15-C, 27-I, 44-I, 51-I, 64-I, 73-X, 75-X, 13-C, 45-I

Nuclear Oversight (NO)/Self-Assessment Reports

Audit 09-15, ODCM/REMP/EPP

Nuclear Oversight Observation Log Reports regarding environmental monitoring/effluent releases

Condition Reports

435861, 429817, 355090, 366258, 439120, 429817, 369351, 383081, 384945, 398807, 370518, 386519, 341365, 353132, 417715, 434037, 355090, 436889, 437196, 437437

Instrument Calibration Records

Air Sampler Nos. 6083, 6084, 6085, 6086, 6223, 6386, 6338, 6147

Meteorological Instrumentation (Primary & Backup) dated July 27, 2011

Miscellaneous Reports

2009 and 2010 Annual Radiological Environmental Operating Reports

Quality Assurance Annual Results of AREVA Environmental Laboratory 4<sup>th</sup> quarter 2010

Unit 2 Operator Plant Equipment Rounds Log for ISFSI

2010 & 2011 Quarterly Meteorological Data Certification

2009, 2010 and 2011 Quarterly Area (ISFSI) TLD Monitoring Report

Teledyne Brown Quarterly Cross Check Program – 3<sup>rd</sup> and 4<sup>th</sup> quarter 2010

50.75 (g) Decommissioning Records

RETS/ODCM Performance Indicator Data for June 2010 through July 2011

ISFSI TLD Monitoring Data 3<sup>rd</sup> Quarter 2009 through 1<sup>st</sup> Quarter 2011

Aquatic REMP Oyster Sampling Manual

REMP Investigative Reports for 2011

2010 and 2011 Quarterly REMP Terrestrial Sampling Reports

D/Q Analysis to Support REMP Sampling

Land Use Census Review 2010

40CFR190 Offsite Direct Shine Dose Estimate for 2010

**Section 40A1: Performance Indicator (PI) Verification**

Condensate Storage Tank and Auxiliary Feedwater System Health Report 2<sup>nd</sup> quarter 2011

Containment Spray System Health Report, 2<sup>nd</sup> quarter 2011

Emergency Diesel Generator and Fuel Oil System Health Report 2<sup>nd</sup> quarter 2011

EP-AA-103, Emergency Preparedness Performance Indicators, Revision 0

High Pressure Safety Injection System Health Report, 2<sup>nd</sup> quarter 2011

Performance Indicator Data – 4<sup>th</sup> quarter 2010 to 2<sup>nd</sup> quarter 2011

RBCCW System Health Report, 2<sup>nd</sup> quarter 2011

Service Water System Health Report, 2<sup>nd</sup> quarter 2011

MRE012331	MRE013148	MRE012534
MRE012473	MRE013179	MRE013537
MRE012480	MRE013196	MRE013538
MRE012481	MRE013409	MRE013543
MRE012588	MRE013459	MRE013547
MRE012589	MRE013475	MRE013565
MRE012631	MRE013494	MRE013574
MRE012641	MRE013500	MRE013576
MRE012647	MRE013506	MRE013606
MRE012648	MRE013508	MRE013613
MRE012650	MRE013510	MRE013619
MRE012654	MRE013511	MRE013621
MRE012696	MRE013512	MRE013640
MRE012701	MRE013513	MRE013645
MRE012705	MRE013515	MRE013669
MRE012706	MRE013517	MRE013678
MRE012843	MRE013518	MRE013885
MRE012955	MRE013525	MRE013919
MRE013042	MRE013529	MRE013936
MRE013046	MRE013530	MRE014035
MRE013061	MRE013531	
MRE013111	MRE013532	

**Section 40A2: Identification and Resolution of Problems**

OD00436, Flange leak in 10" SW line to 'A' EDG  
 ODM000214, SIT#3 leaking  
 ODM000215, FRV positioner not reliable  
 OP-AA-1700, "Operations Aggregate Impact," Revision 3  
 OPSTAT Database  
 SO-11-011, 2-MS-79A/B may not ramp closed as required upon a power reduction  
 CR440376  
 CR446133

**Section 40A3: Event Follow-up**

AOP 2560, "Storms, Winds and High Tides," Revision 010-06  
 AOP 3569, "Severe Weather Conditions," Revision 017-00  
 AOP 3575, "Rapid Downpower," Revision 017-05

### LIST OF ACRONYMS

AC	alternating current
ADAMS	Agencywide Documents Access and Management System
AFW	auxiliary feedwater
ALARA	as low as reasonably achievable
ANS	alert and notification system
ASME	American Society of Mechanical Engineers
CAP	corrective action program
CFR	Code of Federal Regulations
CIV	containment isolation valve
CR	condition report
CW	circulating water
DNB	departure from nucleate boiling
DNC	Dominion Nuclear Connecticut
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
EAL	emergency action level
EDG	emergency diesel generator
EP	emergency preparedness
ERO	emergency response organization
ESF	engineered safety feature
FSAR	final safety analysis report
HPSI	high pressure safety injection
I&C	instrumentation and control
IMC	Inspection Manual Chapter
ISFSI	independent spent Fuel storage installation
IST	in-service Testing
LER	Licensee Event Reports
mrem	millirem
MSPi	mitigating system performance indication
NCV	non-cited violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OD	operability determinations
ODCM	off-site dose calculation manual
OOS	out of service
PARS	Publicly Available Records System
PI	performance indicator
PI&R	problem identification and resolution
PMT	post maintenance testing
RBCCW	reactor building closed cooling water
REMP	Radiological Environmental Monitoring Program
RETS	Radiological Effluents Technical Specification
RHR	residual heat removal
RSS	recirculation spray system
SBO	station blackout

SDP	Significance Determination Process
SG	steam generator
SIH	safety injection high
SW	service water
TLD	thermoluminescent dosimeter
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
UT	ultrasonic testing
VHRA	very high radiation areas
WO	work order



# CONNECTICUT YANKEE ATOMIC POWER COMPANY

HADDAM NECK PLANT

362 INJUN HOLLOW ROAD • EAST HAMPTON, CT 06424-3099

To: Fuel Storage Advisory Committee Member

Date: 11/7/2011

From: J.M. Lenois *amy*

ISFSI-11-122

Subject: Connecticut Yankee (CY) Fuel Storage Advisory Committee Update November 2011

## **CY ISFSI SITE UPDATE**

### **ISFSI Operations**

- CY ISFSI operations have been normal.
- There were no lost time accidents or OSHA recordable injuries, or first aid cases reported since the May 2011 report.
- The diesel generator replacement project is complete.
- DEP oversight of the CY Groundwater Monitoring Plan continues with periodic site inspections and briefings on the groundwater monitoring program sample results. The program includes sixty-two (62) sampling locations from fifty-nine (59) wells. The September 2011 sampling is complete. Preliminary results show all wells below Remediation Standard Regulations (RSRs) for both chemical and radiological constituents. The results will be posted on the CY website as requested at the May 2011 meeting. CY is planning to meet with the CT DEP in November to discuss the status of the program and well closure plans and schedules.

## **Federal Nuclear Waste Management Program Update**

### **Blue Ribbon Commission (BRC)**

The BRC issued its draft report on July 29<sup>th</sup>, 2011. It included as one of its key recommendations the following: "Spent fuel currently being stored at shutdown reactor sites should be "first in line" for transfer to consolidated interim storage." A copy of the statements and recommendations in the draft report that address the needs of the shutdown sites is attached. The comment period on the draft report ended October 31<sup>st</sup>. The final report is due to the Secretary in January 2012.



The Haddam First Selectman and Chair of the CY Fuel Storage Advisory Committee submitted a comment letter on the draft report to the BRC in advance of their public meeting in Boston on October 12<sup>th</sup> – the letter addressed the key statements and recommendations in their draft report relative to the needs of shutdown reactor sites (copy attached).

Congressman Courtney submitted a letter to the BRC that was read into the record at the October 12<sup>th</sup> BRC public meeting in Boston – his letter was supportive of the BRC's recommendation for priority removal of shutdown plant SNF (copy attached).

### **Department of Energy Nuclear Waste Management Program**

The DOE continued to follow the President's direction and the Office of Civilian Radioactive Waste Management and the Yucca Mountain project is completely dismantled. The DOE's Office of Nuclear Energy will integrate any nuclear waste disposal related activities into its fuel cycle long term research & development program.

The U.S. General Accountability Office is conducting a study of the safety and security of spent nuclear fuel at the request of the U.S. House Energy and Commerce Committee and several of its Subcommittees. As part of their study, they visited CY in October 2011 to review the situation at stand alone ISFSI sites – there was a heavy focus on security issues. They are still in the scoping phase of the study with no timeline set by the House Committee/Subcommittees. The study team also visited operating sites in October and planned to meet with the Congressional staff to develop the scope and timeline of the study.

### **Yucca Mountain License Application**

The NRC Commissioners issued an order on September 9<sup>th</sup> stating that in the matter of whether the Commission should review, and reverse or uphold, the Yucca Mountain (YM) Atomic Safety and Licensing Board's (ASLB's) decision denying the DOE's motion to withdraw its construction authorization application with prejudice, that the Commission found itself evenly divided on whether to take the affirmative action of overturning or upholding the Board's decision. It further directed the Board to, by the close of the current fiscal year, complete all necessary and appropriate case management activities, including disposal of all matters currently pending before it and comprehensively documenting the full history of the adjudicatory proceeding.

The Yucca Mountain ASLB issued a Memorandum and Order on September 30<sup>th</sup> suspending the YM proceeding. Although the ASLB confirmed that DOE cannot pull its license application to build a repository at Yucca Mountain, the board also said the agency's review of the proposal would be suspended for lack of money and uncertainty over staffing. The Board concluded, "Although we have been informed that the agency has current appropriated Fiscal Year 2011 Nuclear Waste Funds (NWFs) that could be carried over into the next fiscal year, there are no Full-Time Equivalent (FTE) positions (i.e., federal employee positions) requested in the President's Fiscal Year 2012 Budget

for Yucca Mountain High-Level Waste activities. Therefore, because both future appropriated NWF dollars and FTEs for this proceeding are uncertain, and consistent with the Commission's Memorandum and Order of September 9, 2011, this proceeding is suspended."

The US Court of Appeals presiding over the consolidated petitioners (Aiken County; states of SC and WA) lawsuit opposing DOE's withdrawal of the Yucca Mountain License Application case dismissed the petitions in early September for lack of jurisdiction. Subsequent to the decision, the petitioners filed a writ of mandamus asking that the Court of Appeals determine that the NRC has unreasonably delayed consideration of the license application and compel the NRC to immediately resume consideration and rule on the Yucca Mountain license application within 30 days. National Association of Regulatory Utility Commissioners (NARUC) also joined the lawsuit and were included in the writ of mandamus filing. There was an order issued by the Court on November 4<sup>th</sup> allowing the State of Nevada as an intervener and granting the motion to expedite setting a schedule for briefings to begin December 5<sup>th</sup> with final briefs due February 13<sup>th</sup>..

### **Nuclear Regulatory Commission**

As reported in the May update, the NRC published its waste confidence decision that amended the Commission's generic determination on the environmental impacts of storage of spent fuel at, or away from, reactor sites after the expiration of reactor operating licenses. The decision stated that NRC had confidence that spent fuel could be safely stored at reactors sites for a 120 year period (essentially a 60 wet pool operating life period and a 60 year dry cask storage period).

In late September the NRC staff held the first of its public meetings on their plan to review regulations for extended storage of spent fuel and its transportation off-site after storage. Earlier in the year the Commission directed the NRC staff to combine that effort with a separate initiative to plan for a long-term waste confidence rulemaking that will also address the impacts of storing spent fuel beyond 120 years. The NRC staff is planning to: 1) develop a long-term Waste Confidence rule, including an environmental impact statement (EIS) and updated waste confidence decision, for the handling and extended storage of spent nuclear fuel for more than 60 years after a reactor's licensed life; and, 2) describe the integration of waste storage activities with the extended storage and transportation project plan activities. The Staff considers a timeframe of 120 up to 300 years of storage to be appropriate for characterization and prediction of aging effects and aging management issues for extended storage and transportation. The Staff plans to develop a final report on a preliminary Environmental Impact Statement (EIS) framework and initiate a formal National Environmental Policy Act (NEPA) process (public scoping) in 2012. NRC also plans to complete a draft EIS, draft decision, and draft proposed rule for public comment before 2018, with a final EIS and decision (and rule if applicable) by the end of 2019.

The Attorney General's from New York, Connecticut and Vermont filed a lawsuit in the D.C. Circuit challenging the NRC's waste confidence rule. The suit challenged that NRC

violated the Federal Administrative Procedures Act and NEPA when it found that – without conducting site specific studies – that no significant safety or environmental impacts will result from storing High Level Waste (HLW) onsite at more than 100 sites around the country for 60 or more years after the reactors are closed. The State’s filed formal briefs September 15<sup>th</sup>.

The Decommissioning Plant Coalition and the individual Yankee companies submitted comment letters to the NRC regarding NRC Draft Guide 5033, “Security Performance (Adversary) Characteristics for Physical Security Programs for 10 CFR Part 72 Licensees”. The letters expressed serious concerns regarding the scope of the regulatory bases and changes in DG 5033 and the associated impacts upon implementation on standalone ISFSIs.

### **Congressional Update**

There is a Continuing Resolution that continues funding the government through mid November and there remains no funding for the DOE waste management program.

The House approved the fiscal 2012 Energy & Water Development Appropriations spending bill (H.R. 2354) which included some funding for the NRC review of the Yucca Mountain nuclear waste repository program license application. The Senate Appropriations Committee marked up and passed its Energy & Water Development FY 2012 bill in early September. The E&WD Subcommittee Chairwoman Feinstein included some language requiring the DOE to create a strategy for spent fuel storage, including options for consolidating and storing spent fuel at one or more regional sites. Congressional leaders appear to have reached an agreement to advance several smaller bundles of appropriations legislation instead of moving forward with the 12 individual funding measures, or an overarching single Omnibus Appropriations bill. These "mini-buses" will seek to combine 2 or 3 appropriations bills at a time. Speaker Boehner has indicated he does not want to proceed with an Omnibus measure, and with the current Continuing Resolution funding bill set to expire on November 18th, there is not enough time for lawmakers to debate, pass, and conference the individual spending bills.

The “Nuclear Fuel Storage Improvement Act (S. 1320)” that would create two federal interim storage repositories to centralize spent nuclear fuel storage (that also includes a provision for priority acceptance of permanently shutdown decommissioned plant spent fuel) is still pending action with the Senate Environment and Public Works Committee.

### **Other Related Efforts Update**

Yankee continued to work with the Decommissioning Plant Coalition, as well as the New England Governors’ Conference and the New England Council, and others to communicate to the administration, congress, and the BRC the shutdown reactor spent fuel storage issues and the basis for priority attention to the needs of the shutdown reactor sites. Yankee will also continue its efforts to expedite the removal of the fuel from the site through organizations such as the Nuclear Waste Strategy Coalition; the Nuclear

Energy Institute; and the National Association of Regulatory and Utility Commissioners. The continued support of these organizations will hopefully result in recommendations in the final BRC that support priority removal from shutdown sites.

### **DOE Spent Fuel Lawsuit Status Update**

#### **Yankee Phase I Cases**

On September 7, 2010 the U.S. Court of Federal Claims issued a favorable decision in the Yankee Companies' ongoing litigation over the U.S. Department of Energy's failure to remove Spent Nuclear Fuel and Greater than Class C Waste from the three New England Yankee nuclear reactor sites as required by contract and law was appealed by the government. The approximate damages awarded to the three Yankee companies were: Yankee Atomic Electric Company, \$21 million; Connecticut Yankee Atomic Power Company, \$40 million; and Maine Yankee Atomic Power Company, \$82 million.

All briefing has been completed and submitted to the appellate court. The court scheduled November 7th for the oral argument.

#### **Yankee Phase II Cases**

In December 13, 2007 the Yankee Companies filed a second round of damages claims in the U.S. Court of Federal Claims. Judge Merow denied the government's motion to amend the scheduling order in the case to delay the trial for 90 days to allow them more time to review additional documents provided in discovery. The trial began October 11, 2011 and lasted three days. The Judge, at the government's request is keeping the trial record open until at least November 14, 2011 to allow the government to complete their review of the documents produced in discovery. At the end of this period, the Judge requested the parties to submit a status report on any outstanding discovery issues.

## **Connecticut Yankee Fuel Storage Advisory Committee Meeting**

**Tuesday, May 17, 2011 Riverhouse at Goodspeed Station Haddam, CT**

### **CY Status**

#### **Industrial Safety**

There were no Lost Time Accidents or OSHA recordable injuries reported since the last report.

#### **ISFSI**

- ISFSI operations are normal.
- Staffing levels are stable.
- Annual Local Law Enforcement Training occurred April 21, 2011.
- Annual Fire Department Training occurred April 21, 2011

#### **Regulatory Affairs**

##### **CT DEP**

##### **Groundwater Monitoring Program**

A total of twenty-three (23) monitoring well locations were sampled for chemical constituents and thirty-seven (37) locations were sampled for radiological constituents in the First Quarter 2011 monitoring event.

All samples submitted for chemical analysis contained parameters below applicable RSR Criteria, if detected at all. Following this monitoring event, seven (7) monitoring wells are now in compliance with RSR Criteria for chemical constituents, and chemical sampling is no longer required.

All samples submitted for radiological analysis contained parameters below applicable RSR Criteria, if detected at all. Following this monitoring event, thirty-three (33) monitoring wells are now in compliance with RSR Criteria for radiological constituents, and radiological sampling is no longer required.

##### **Groundwater Summary:**

The Groundwater Monitoring Plan includes sixty-two (62) sampling locations from fifty-nine (59) wells.

- Four (4) monitoring locations remain in the quarterly sampling program (three (3) for chemical constituents and one (1) for radiological constituents).
- Eighteen (18) monitoring locations remain in the semi-annual sampling program to demonstrate long-term groundwater compliance with RSR Criteria.
- Forty (40) monitoring locations no longer require monitoring and await abandonment.

## **NRC**

The NRC conducted a safety inspection on November 29, 2010. The inspection included all aspects involving the safe operation of the Independent Spent Fuel Storage Installation at Connecticut Yankee with the exception of the Security Program. The Security Program will be inspected during 2011. There were no issues or findings identified.

## **ANNOUNCEMENT**

### **ADVANCES IN NUCLEAR POWER TECHNOLOGY STUDY BRIEFING FOR THE CONNECTICUT ENERGY ADVISORY BOARD**

The Connecticut Academy of Science and Engineering (CASE) will conduct a Briefing on the study, *Advances in Nuclear Power Technology*, for the Connecticut Energy Advisory Board (CEAB) on the following date/time:

**WHEN: Friday, December 9; 1:00-5:00 p.m.**

**WHERE: Legislative Office Building at the State Capitol, Room 1C**  
**For Directions go to: <http://www.cga.ct.gov/capitolours/directions.htm>**

The agenda for the Briefing with presenters noted will be:

- 1. Introduction and Brief Statement of Primary Conclusion**  
Richard H. Strauss, Executive Director, CASE
- 2. Overview of Nuclear Power**  
Regis A. Matzie, *Academy Member & Study Committee Member*, Executive Consultant, Westinghouse Electric Company
- 3. Advances in Nuclear Power**  
Regis A. Matzie, Executive Consultant, Westinghouse Electric Company
- 4. Economic Impact of Nuclear Power Generated in Connecticut**  
Stanley McMillan, Managing Economist, Connecticut Department of Economic & Community Development
- 5. Assessing Connecticut Residents' Opinions of Nuclear Power Phone Survey Results, December 2010**  
Alissa K. DeJonge, Director of Research, Connecticut Economic Resource Center
- 6. Findings and Recommendations**  
David Pines, *CASE Study Manager*, Associate Professor and Chair of Civil, Environmental, and Biomedical Engineering, University of Hartford  
Lee Langston, *Academy Member & Study Committee Chairman*, Emeritus Professor of Mechanical Engineering, University of Connecticut

Note: Q&A will be held for items 2-6 following each of these presentations.



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

November 28, 2011

Holders of Licenses for Operating  
Power Reactors as Listed in the Enclosure

**SUBJECT: RESCISSION OR PARTIAL RESCISSION OF CERTAIN POWER REACTOR  
SECURITY ORDERS APPLICABLE TO NUCLEAR POWER PLANTS**

Following the terrorist attacks on September 11, 2001, the U.S. Nuclear Regulatory Commission (NRC) supplemented the security measures required for protection against the design-basis threat at nuclear power reactor facilities through a series of security orders. These orders established new requirements for specific training enhancements; access authorization enhancements; and enhancements to defensive strategies, mitigative measures, and integrated response.

Following the issuance of the orders, each operating reactor licensee addressed the actions in the power reactor security orders in a response to the NRC. In its review of licensees' responses to the security orders, the NRC staff (the staff) found that licensees had incorporated many of the order requirements into their respective NRC-approved physical security plans, training and qualification plans, and safeguards contingency plans.

The NRC amended Title 10 of the *Code of Federal Regulations* (10 CFR) Parts 50, 52, 72, and 73, including Appendices B and C to Part 73, through a final rule ("Power Reactor Security Requirements") published in the *Federal Register* on March 27, 2009 (74 FR 13925). The rulemaking codified generically applicable security requirements previously issued by orders and updated the existing power reactor security requirements. The rule became effective on May 26, 2009. Licensees were required to be in compliance with the final rule no later than March 31, 2010.

The power reactor security rulemaking incorporated all or part of the requirements set forth in the following power reactor security orders:

- EA-02-026, "Order for Interim Safeguards and Security Compensatory Measures," dated February 25, 2002 (Partial)
- EA-02-261, "Order for Compensatory Measures Related to Access Authorization," dated January 7, 2003 (All)
- EA-03-039, "Order for Compensatory Measures Related to Training Enhancements on Tactical and Firearms Proficiency and Physical Fitness Applicable to Armed Nuclear Power Plant Security Force Personnel," dated April 29, 2003 (All)

Therefore, the staff has determined that the generically applicable security requirements set forth in the orders are adequately captured in the applicable NRC regulations with the exception of three requirements from the Interim Safeguards and Security Compensatory Measures Order



(EA-02-026). The staff has developed several regulatory guides that detail acceptable methods of complying with the security requirements.

Three requirements from Order EA-02-026 have not been completely captured in current regulations. Requirements B.5.d (partially captured) and B.5.e (not captured) of Order EA-02-026 are being incorporated into the final emergency preparedness rulemaking documents (10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," Sections IV.E and IV.B, respectively). Therefore, these particular Order requirements will remain in force. When the emergency preparedness rule is effective the NRC will determine when Requirements B.5.d and B.5.e of Order EA-02-026 can be rescinded. The remaining requirement of Order EA-02-026 not covered by proposed or existing regulations (B.1.a) involves operator training and shall remain in effect.

In light of the above determination, I hereby rescind the requirements of Orders EA-03-039 and EA-02-261 in their entirety, and rescind, in part, the requirements of Order EA-02-026. All requirements in Order EA-02-026 are rescinded except Requirements B.1.a, B.5.d, and B.5.e.

Licensees should assess how the rescission and partial rescission of the above referenced orders will affect their facility licenses and security plans to ensure compliance with the associated regulatory requirements. Please contact your licensing project manager to facilitate resolution of any issue related to the requirements outlined in this letter, or if you have any other questions.

Sincerely,

A handwritten signature in black ink that reads "Eric J. Leeds" with "acting" written in smaller letters below it.

Eric J. Leeds, Director  
Office of Nuclear Reactor Regulation

Docket Nos.: See Enclosure

cc: Listserv

## Docket Numbers

50-313, 50-368  
50-334, 50-412  
STN 50-456, STN 50-457  
STN 50-454, STN 50-455  
50-461  
50-237, 50-249  
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50-254, 50-265  
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50-302  
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50-220, 50-410  
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STN 50-528, STN 50-529, STN 50-530  
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50-335, 50-389  
50-250, 50-251  
50-387, 50-388  
50-395  
50-382  
50-482

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Sincerely,

/RA/ B. A. Boger for

Eric J. Leeds, Director  
Office of Nuclear Reactor Regulation

Docket Nos.: See enclosure

cc: Listserv

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See next page

**ADAMS Accession Nos.:** Package/ML112840300; Incoming/ML110460483; Response/ML111220447  
\* concurrence via email

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DATE	10/13/2011	11/21/11	11/28/11		

OFFICIAL RECORD COPY

Letter to Holders of Licenses for Operating Power Reactors from Eric J. Leeds dated November 28, 2011.

**SUBJECT: RESCISSION OR PARTIAL RESCISSION OF CERTAIN POWER REACTOR SECURITY ORDERS APPLICABLE TO NUCLEAR POWER PLANTS**

**DISTRIBUTION:** G20110112/EDATS: OEDO-2011-0142

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VDricks, OPA RIV			MKotzalas, EDO Region II
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RidsNrrPMDresden Resource		RidsNrrPMFortCalhoun Resource	
RidsNrrPMLaSalle Resource		RidsNrrPMGrandGulf Resource	
RidsNrrPMQuadCities Resource		RidsNrrPMHopeCreek Resource	
RidsNrrPMLimerick Resource		RidsNrrPMSalem Resource	
RidsNrrPMOysterCreek Resource		RidsNrrPMIndianPoint Resource	
RidsNrrPMPeachBottom Resource		RidsNrrPMFitzPatrick Resource	
RidsNrrPMThreeMileIsland Resource		RidsNrrPMPilgrim Resource	
RidsNrrPMBrownsFerry Resource		RidsNrrPMVermontYankee Resource	
RidsNrrPMSequoyah Resource		RidsNrrPMKewaunee Resource	
RidsNrrPMWattsBar1 Resource		RidsNrrPMMillstone Resource	
RidsNrrPMBrunswick Resource		RidsNrrPMNorthAnna Resource	
RidsNrrPMShearonHarris Resource		RidsNrrPMSurry Resource	
RidsNrrPMRobinson Resource		RidsNrrPMMonticello Resource	
RidsNrrPMCrystalRiver Resource		RidsNrrPMPrairieIsland Resource	
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RidsNrrPMNineMilePoint Resource		RidsNrrPMPerry Resource	
RidsNrrPMREGinna Resource		RidsNrrPMPointBeach Resource	
RidsNrrPMCatawba Resource		RidsNrrPMRiverBend Resource	
RidsNrrPMMcGuire Resource		RidsNrrPMSanOnofre Resource	
RidsNrrPMOconee Resource		RidsNrrPMSeabrook Resource	
RidsNrrPMColumbia Resource		RidsNrrPMSouthTexas Resource	
RidsNrrPMComanchePeak Resource		RidsNrrPMStLucie Resource	
RidsNrrPMCooper Resource		RidsNrrPMTurkeyPoint Resource	

RidsNrrPMDavisBesse Resource  
RidsNrrPMDiabloCanyon Resource  
RidsNrrPMDCCook Resource  
RidsNrrMailCenter Resource  
RidsNrrPMWattsBar1 Resource  
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RidsNrrPMSummer Resource  
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## **Possible NEAC Meeting Topics**

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

Tour of Connecticut Yankee (CY) Independent Spent Fuel Storage Installation (ISFSI)

Presentation on the Advances in Nuclear Power Technology by CT Academy of Science & Engineering

Annual Report Preparation

## **2012 Meeting Schedule**

Thursday April 19, 2012 – NRC 2011 Performance Evaluation

Tuesday May 15, 2012- Tour of Connecticut Yankee Independent Spent Fuel Storage Installation

Thursday June 21, 2012 - Presentation on the Advances in Nuclear Power Technology by CT Academy of Science & Engineering

Thursday September 20, 2012 – Tour of Millstone Power Station/Dominion Update

Thursday December 6, 2012 – Annual Report Preparation

Special Meetings would be at the call of the Chairman.