



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION I
2100 RENAISSANCE BLVD., SUITE 100
KING OF PRUSSIA, PA 19406-2713

November 4, 2016

Mr. Daniel G. Stoddard
President and Chief Nuclear Officer
Dominion Resources
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION – INTEGRATED INSPECTION REPORT
05000336/2016003 AND 05000423/2016003

Dear Mr. Stoddard:

On September 30, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Millstone Power Station (Millstone), Units 2 and 3. On October 5, 2016, the NRC inspectors discussed the results of this inspection with Mr. John Daugherty, Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented two findings of very low safety significance (Green) in this report. Both of these findings involved violations of NRC requirements. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violations or significance of these NCVs, 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; and the NRC Resident Inspector at Millstone. In addition, if you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement 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 U. S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC, 20555-0001; with copies to the Regional Administrator, Region I, and the NRC Resident Inspector at Millstone.

D. Stoddard

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This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Eugene M. DiPaolo, Chief
Reactor Projects Branch 2
Division of Reactor Projects

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

Enclosure:
Inspection Report 05000336/2016003 and 05000423/2016003
w/Attachment: Supplementary Information

cc w/encl: Distribution via ListServ

D. Stoddard

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos. 50-336 and 50-423

License Nos. DPR-65 and NPF-49

Report Nos. 05000336/2016003 and 05000423/2016003

Licensee: Dominion Nuclear Connecticut, Inc. (Dominion)

Facility: Millstone Power Station, Units 2 and 3

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

Dates: July 1 through September 30, 2016

Inspectors: J. Ambrosini, Sr. Resident Inspector, Division of Reactor Projects (DRP)
L. McKown, Resident Inspector, DRP
C. Highley, Resident Inspector, DRP
H. Anagnostopoulos, Health Physicist, Division of Reactor Safety (DRS)
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J. Kulp, Senior Reactor Engineer, DRS
K. Warner, Project Engineer, DRP
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Approved By: Eugene M. DiPaolo, Chief
Reactor Projects Branch 2
Division of Reactor Projects

Enclosure

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SUMMARY

Inspection Report 05000336/2016003, 05000423/2016003; 07/01/2016 – 09/30/2016; Millstone Power Station (Millstone), Units 2 and 3; Licensed Operator Requalification and Maintenance Effectiveness.

This report covered a three-month period of inspection by resident inspectors and announced baseline inspections performed by regional inspectors. The inspectors identified two non-cited violations (NCVs), both of which were of very low safety significance (Green). The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within Cross-Cutting Areas," dated December 4, 2014. All violations of U.S. Nuclear Regulatory Commission (NRC) requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

Cornerstone: Mitigating Systems

Green. The inspectors identified a Green NCV of Technical Specification (TS) 6.8.1.a, for Dominion's failure to implement procedures as required by Regulatory Guide 1.33, Revision 2, Appendix A.1, "Administrative Procedures", during the performance of watch turnover. This resulted in multiple operators across multiple crews in both Unit 2 and 3 standing watch without performing a review of the applicable standing orders for up to 4 months from March to July 2016. Dominion entered the condition in their corrective action program (CAP) as condition report (CR)1042287.

The inspectors determined that the finding was more than minor because if left uncorrected the performance deficiency could lead to a more significant event. Specifically, the operators did not review TS amendments, emergency action level classifications, emergency operating procedures, and plant computer issues impacting the plant prior to taking watch. Without reviewing the standing orders to understand the information contained within, operators could potentially take improper actions to control the plant during evolutions and abnormal conditions. The finding was determined to be of very low safety significance (Green) because it did not affect design or qualification of a mitigating structure, system, and component (SSC), did not represent a loss of system function, and did not involve external event mitigation systems. The inspectors determined that the finding has a cross-cutting aspect in the Human Performance cross-cutting area associated with Field Presence, where leaders are commonly seen in the work areas of the plant observing, coaching, and reinforcing standards and expectations. Specifically, Dominion leadership observations in the control room or management review of monthly standing order audits could have discovered the deviation from standards and expectations. [H.2] (Section 1R11)

Cornerstone: Initiating Events

Green. The inspectors identified a Green NCV of Title 10 of the *Code of Federal Regulations* (10 CFR) 50.65(b)(1), for Dominion's failure to include the safety-related Unit 2 Pressurizer Safety Valve, Acoustic Valve Monitoring System (AVMS) SSC within the scope of the maintenance rule program. Specifically, Dominion removed the Millstone Unit 2 AVMS, which is required to remain functional during and following a design bases event to provide indication to

operators in the control room of significant abnormal degradation of the reactor coolant pressure boundary and monitor for loss of coolant due to an open safety relief valve, from the scope of the maintenance rule monitoring program. Dominion has documented this condition in their CAP as CR1049493.

The inspectors determined that the finding was more than minor because it was associated with the equipment performance attribute of the Initiating Events cornerstone and adversely affected the objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, Dominion's removal of AVMS from maintenance rule performance and condition monitoring and the failures observed have resulted in the complete loss of availability and reliability of each channel of AVMS such that they cannot perform their intended function. The finding was determined to be of very low safety significance (Green) because the conditions associated with the most applicable design basis event are bound by the small break loss of coolant accident (LOCA) analysis and did not affect other systems used to mitigate a LOCA. This finding has a cross-cutting aspect in the Human Performance cross-cutting area associated with Procedure Adherence, in that Millstone Maintenance Rule Expert Panel (MREP) members did not follow the Dominion maintenance rule program implementing procedure, ER-AA-MRL-100, which provides guidance for scoping systems into the maintenance rule. [H.8] (Section 1R12)

REPORT DETAILS

Summary of Plant Status

Unit 2 began the inspection period at 100 percent power. On August 5, 2016, Dominion took Unit 2 offline to facilitate repairs of a breaker in the switchyard. Operators held power at approximately 10 to 13 percent until Eversource completed the repairs which allowed Unit 2 to come back online. Unit 2 reached 100 percent power on August 8. On August 11, Unit 2 experienced the loss of two circulating water pumps due to a failure of the uninterruptible power supply for the variable frequency drive for the circulating pumps following a lightning strike. Operators took manual action to trip the reactor in response to the resultant degrading condenser vacuum. Unit 2 returned to 100 percent power on August 14 and remained at or near 100 percent power for the duration of the inspection period.

Unit 3 began the inspection period at 100 percent power and remained at or near there for the duration of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 1 sample)

.1 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

The inspectors reviewed Dominion's preparations for the onset of a tropical depression on September 2, at Units 2 and 3. The inspectors reviewed the implementation of adverse weather preparation procedures before the onset of and during this adverse weather condition. The inspectors walked down the emergency diesel generators (EDGs) and service water (SW) system to ensure system availability and a general site walkdown of all external areas of the plant to observe the condition of the flood gates, water flood doors, and general area missile hazards. The inspectors verified that operator actions defined in Dominion's adverse weather procedure maintained the readiness of essential systems. The inspectors discussed readiness and staff availability for adverse weather response with operations and work control personnel. Documents reviewed for each section of this inspection report are listed in the Attachment.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04 – 4 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

Unit 2

- 'A' and 'B' reactor building component cooling water (RBCCW) on August 24

Unit 3

- 'A' EDG during 'B' EDG sequencer maintenance on July 11
- 'A' quench spray system following system restoration on September 21
- 'B' safety injection (SI) system during 'A' SI train maintenance and surveillances on September 28

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

b. Findings

No findings were identified.

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

a. Inspection Scope

On September 1, the inspectors performed a complete system walk down of the Unit 3 chemical and volume control system to ensure proper system alignment and identification of any material conditions that have the potential to affect functionality of the system. The inspectors reviewed emergency operating procedures, drawings, and the UFSAR to verify that the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, component lubrication and equipment cooling, hanger and support functionality, and operability of support systems. The inspectors performed field walk downs of accessible portions of the systems to verify as-built system configuration matched plant documentation. The inspectors confirmed that systems and components were aligned correctly, environmentally qualified, and

protected against external threats. The inspectors also examined the material condition of the components for degradation and observed operating parameters of equipment to verify that there were no deficiencies. Additionally, the inspectors reviewed a sample of related CRs to ensure Dominion appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Resident Inspector Quarterly Walkdowns (71111.05Q – 7 samples)

a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that Dominion controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in the area pre-fire plan, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for out of service, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

Unit 2

- RBCCW pump and heat exchanger area (fire area A-1B) on August 24
- 'A' safeguards room (fire area A-8A) on August 30
- Turbine deck operating floor (fire area T-1F) on September 15
- Containment (fire area C-1) during entry at power for 'A' reactor coolant pump (RCP) oil addition on September 27

Unit 3

- North and south residual heat removal cubicles 21'-6" & -4' elevation (fire area ESF 3 and 6) on July 5
- Motor driven auxiliary feedwater pump room (fire area ESF 8 and 9) on July 6
- 'A' and 'B' EDG rooms (fire area EG 3 and 4) on July 12

b. Findings

No findings were identified.

.2 Fire Protection – Drill Observation (71111.05A – 1 sample)

a. Inspection Scope

The inspectors observed a fire brigade drill scenario conducted on August 25 that involved a fire in the Unit 2 'A' EDG cubicle. The inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that Dominion personnel

identified deficiencies, openly discussed them in a self-critical manner at the drill critique, and took appropriate corrective actions as required. The inspectors evaluated specific attributes as follows:

- Proper wearing of turnout gear and self-contained breathing apparatus
- Proper use and layout of fire hoses
- Employment of appropriate fire-fighting techniques
- Sufficient fire-fighting equipment brought to the scene
- Effectiveness of command and control
- Search for victims and propagation of the fire into other plant areas
- Smoke removal operations
- Utilization of pre-planned strategies
- Adherence to the pre-planned drill scenario
- Drill objectives met

The inspectors also evaluated the fire brigade's actions to determine whether these actions were in accordance with Dominion's fire-fighting strategies.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 2 samples)

.1 Internal Flooding Review

a. Inspection Scope

The inspectors reviewed the UFSAR, the site flooding analysis, and plant procedures to assess susceptibilities involving internal flooding. The inspectors also reviewed the CAP to determine if Dominion identified and corrected flooding problems and whether operator actions for coping with flooding were adequate. The inspectors focused on the Unit 2 Fire Pump House on September 20 and the Unit 3 EDG building sump on September 28 while a temporary sump pump was installed to verify the adequacy of the temporary equipment used, equipment seals located below the flood line, floor, and water penetration seals, watertight door seals, common drain lines and sumps, sump pumps, level alarms, control circuits, and temporary or removable flood barriers.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07T – 3 samples)

a. Inspection Scope

Triennial Review – Heat Sink Performance

Heat Exchanger Sample Selection

Based on risk ranking of safety-related heat exchangers, a review of past heat sink inspections, and recent operational experience, the inspectors selected the ultimate heat sink, which included the Unit 2 SW system piping integrity and intake structure functionality and operation. The inspectors also selected for review the inspection and cleaning methods and frequency used to ensure the heat removal capabilities for the 2B EDG air, jacket water, and lube oil coolers, and the 3A SI pump cooler and compared them to Dominion's commitments made in response to Generic Letter 89-13, Service Water System Problems Affecting Safety-Related Equipment.

Triennial Review

The inspectors verified whether potential heat exchanger deficiencies which could mask degraded performance were being identified. The inspectors reviewed the procedures for maintaining the safety function of the selected heat exchangers and determined whether the heat exchangers were effectively monitored by means of inspection and cleaning, and verified that these activities were consistent with Electric Power Research Institute NP-7552, "Heat Exchanger Performance Monitoring Guidelines," and accepted industry practices.

Heat Exchangers Directly Cooled by the Service Water System

For heat exchangers directly cooled by the SW system 2B EDG air, jacket water, and lube oil coolers and the 3A SI pump cooler, the inspectors determined whether testing, inspection, maintenance, and monitoring of biotic fouling and macrofouling programs, singularly or in combination, were adequate to ensure proper heat transfer.

For heat exchanger inspection or cleaning, the inspectors reviewed the methods and results of performance inspections. The inspectors verified the following:

- Methods used to inspect and clean heat exchangers were consistent with as-found conditions identified and expected degradation trends and industry standards;
- Inspection and cleaning activities had established acceptance criteria, and were consistent with industry standards; and
- As found results were recorded, evaluated, and appropriately dispositioned such that the as-left condition were acceptable.

The inspectors reviewed visual inspection records, heat exchanger specification sheets, eddy current test reports, and preventative maintenance activities to determine the structural integrity of the heat exchangers and to verify that the heat exchangers were maintained consistent with design assumptions in the heat transfer calculations associated with normal, accident, and transient conditions, the description of these components in the UFSAR and in accordance with TS requirements. The review also verified the structural integrity of the heat exchangers was maintained. The inspectors

verified that the number of plugged tubes were within pre-established limits, based on heat transfer capability and design heat transfer assumptions, and that tube plugging was accounted for in the heat exchanger performance calculations. The inspectors reviewed flow testing at or near maximum design flow for redundant and infrequently used heat exchangers.

Service Water System

The inspectors verified that potential common cause heat sink performance problems that have the potential to increase risk were being identified (i.e., icing at circulating and SW intake structures). The inspectors verified that Dominion staff adequately identified and resolved heat sink performance problems that could result in initiating events or affect multiple heat exchangers in mitigating systems and thereby increase risk (i.e., component cooling water heat exchanger performance affected by corrosion, fouling, or silting).

SW functions as the ultimate heat sink to provide cooling water flow from the Long Island Sound to the safety-related heat exchangers during normal operation and loss of offsite power. The inspectors reviewed the system design to evaluate the adequacy of system monitoring and performance testing. The inspectors reviewed procedures, calculations, and design drawings to verify they were consistent with the design and licensing basis.

To assess the structural integrity of the SW piping and ensure that piping or intake structure degradation was appropriately identified and dispositioned, the inspectors performed walkdowns of accessible areas of the intake area (including SW pumps, strainers, traveling screens) reviewed station procedures and interviewed engineering personnel. The inspectors reviewed a sample of non-destructive examination records, photographs, videos, and completed or planned corrective actions to assess the structural integrity condition of the SW piping. The inspectors reviewed pipe inspection records and performed a walkdown of accessible areas containing the SW piping to ensure that leakage or degradation was appropriately identified and dispositioned.

The inspectors reviewed operational and maintenance history, system health reports, and in-service testing results for adverse trends and to verify that the SW system functioned as designed. In addition, the inspectors reviewed the monitoring and testing of interface valves between safety-related SW and non-safety-related piping systems to ensure that adequate system flow is available post-accident consistent with design basis assumptions. Surveillance test results were reviewed to verify that the systems and components functioned as designed to verify that the minimum calculated flow rates were properly maintained to essential safety-related components and met the acceptance criteria in the UFSAR and in accordance with American Society of Mechanical Engineers Code requirements.

Problem Identification and Resolution

The inspectors verified that Dominion staff entered significant heat exchanger/sink performance problems in the CAP. The inspectors verified that Dominion's corrective actions were appropriate.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program and Licensed Operator Performance
(71111.11Q – 5 samples)

.1 Quarterly Review of Licensed Operator Regualification Testing and Training (2 samples)

a. Inspection Scope

Unit 2

The inspectors observed Unit 2 licensed operator just in time training on August 4 in preparation for the planned turbine outage to facilitate switchyard repairs. The inspectors evaluated operator performance during the simulated power maneuvers to verify the use of operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

The inspectors observed Unit 2 licensed operators performance during an emergency preparedness (EP) drill conducted on August 17. The inspectors evaluated operator performance during the simulated LOCA, emergency action level determination, and emergency operating procedures to validate the use of the operating procedures. The inspectors assessed the clarity and effectiveness of the communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisors. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

Findings

No findings were identified.

.2 Quarterly Review of Licensed Operator Performance in the Main Control Room (3 samples)

a. Inspection Scope

The inspectors observed operator performance during the evolutions listed below. The inspectors observed crew briefings and focus briefings to verify that the briefings met the criteria specified in Dominion's Operations Section Expectations Handbook. Additionally, the inspectors observed operators monitor and control reactor power to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards.

Unit 2

- Planned main turbine outage on August 5 and 6
- Reactor startup following unplanned plant trip on August 11

Unit 3

- Quarterly turbine valve testing on August 28

b. Findings

Introduction. The inspectors identified a Green NCV of TS 6.8.1.a, for Dominion's failure to implement procedures as required by Regulatory Guide 1.33, Revision 2, Appendix A.1, "Administrative Procedures," during the performance of watch turnover. This resulted in multiple operators across multiple crews in both Unit 2 and 3 standing watch without performing a review of the applicable standing orders for up to 4 months from March to July 2016.

Description. The inspectors noted on four occasions between June 29 and July 13, operators standing watch in the control room had not signed off as having reviewed the standing order binder in the Unit 3 control room. Each time, the inspectors discussed this issue with the on-shift Shift Manager. On July 13, the inspectors discussed this repetitive issue with the Unit 3 operations manager. Dominion documented the concern in CR1042287 and determined that the failure to review standing orders was not limited to Unit 3 operators, but also happened in the Unit 2 control room. Dominion's analysis ultimately concluded that 10 senior reactor operators, 7 reactor operators, and 20 plant equipment (non-licensed) operators stood watch without performing a review of all applicable standing orders for up to 4 months from March to July 2016. Examples of some of the standing orders that were not reviewed by all operators prior to taking the watch include for Unit 2: SO-16-007, "Plant Process Computer (PPC) issues impacting plant operations"; SO-16-012, "Briefing Sheet for Revision to AOP 2568A, RCS Leak, Mode 4, 5, 6, and Defueled"; SO-16-016, "EAL Classification Briefing Sheet - C OP 200.5 Clarification"; and SO-16-018, "License Amendment 326 Tech Spec LBDCR 15-MP2-009, Containment Leakage Rate Testing Program". For Unit 3, examples of standing orders that were not reviewed include: SO-16-004, "TS Amend 266"; SO-16-012, "ES-0.1 Continuous Action Step Clarification"; SO-16-16, "Operating Control Switches"; and SO-16-19, "Classification Without the SM".

Dominion procedure OP-AA-100, "Conduct of Operations," Revision 031, Attachment 2, requires, in part, that standing orders that involve TS changes shall be reviewed prior to assuming the watch. Also, Attachment 7 of the same procedure defines standing orders as temporary instructions from Operations Management and temporary orders are to be reviewed by shift operations as part of the shift turnover process. Additionally, there is a monthly required standing orders audit which did not identify these discrepancies. Dominion's immediate corrective actions included requiring all operators to perform a review of all standing orders prior to taking the watch and the development of a turnover checklist to include reminders of the procedural requirements to review standing orders as part of the shift turnover process.

Analysis. The inspectors determined that the failure to review the standing orders prior to taking the watch as required by the Conduct of Operations is a performance

deficiency that was within Dominion's ability to foresee and correct. The inspectors determined that the finding was more than minor because if left uncorrected the performance deficiency could lead to a more significant event. Specifically, the operators did not review TS amendments, emergency action level classifications, emergency operating procedures, and plant computer issues impacting the plant prior to taking watch. Without reviewing the standing orders to understand the information contained within, operators could potentially take improper actions to control the plant during evolutions and abnormal conditions. The finding is associated with the Mitigating Systems cornerstone. The finding was evaluated in accordance with IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," and determined to be of very low safety significance (Green) because it did not affect design or qualification of a mitigating SSC, did not represent a loss of system function, and did not involve external event mitigation systems. The inspectors determined that the finding has a cross-cutting aspect in the Human Performance cross-cutting area associated with Field Presence, where leaders are commonly seen in the work areas of the plant observing, coaching, and reinforcing standards and expectations. Specifically, Dominion leadership observations in the control room or management review of monthly standing order audits could have discovered the deviation from standards and expectations. [H.2]

Enforcement. TS 6.8.1, "Procedures," requires that written procedures be established, implemented, and maintained for activities described in Appendix A of Regulatory Guide 1.33, "Quality Assurance Program Requirements." Specifically, Section 1 of Regulatory Guide 1.33, Appendix A includes shift and relief turnover. OP-AA-100, "Conduct of Operations", Attachment 2 requires in part that standing orders that involve TS changes shall be reviewed prior to assuming the watch. Also, Attachment 7 of the same procedure defines standing orders as temporary instructions from Operations Management and temporary orders are to be reviewed by shift operations as part of the shift turnover process. Contrary to the above, Dominion personnel on watch have not consistently been reviewing standing orders prior to assuming the watch. Specifically, 10 senior reactor operators, 7 reactor operators, and 20 plant equipment operators stood watch without performing a review of all applicable standing orders for up to 4 months from March to July 2016. Dominion's immediate corrective actions included requiring all operators to perform a review of all standing orders prior to taking the watch and the development of a turnover checklist to include reminders of the procedural requirements to review standing orders as part of the shift turnover process. Because this issue is of very low safety significance (Green) and has been entered into Dominions CAP (CR1042287), this violation is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy. **(NCV 05000423/2016003-01 and NCV 05000336/2016003-01: Failure to Review Standing Orders)**

1R12 Maintenance Effectiveness (71111.12Q – 4 samples)

a. Inspection Scope

The inspectors reviewed the sample listed below to assess the effectiveness of maintenance activities on SSC performance and reliability. The inspectors reviewed system health reports, CAP documents, maintenance work orders, and maintenance rule basis documents to ensure that Dominion was identifying and properly evaluating performance problems within the scope of the maintenance rule. For each sample selected, the inspectors verified that the SSC was properly scoped into the maintenance

rule in accordance with 10 CFR 50.65 and verified that the (a)(2) performance criteria established by Dominion staff was reasonable. As applicable, for SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a)(2). Additionally, the inspectors ensured that Dominion staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

Unit 2

- RCPs on July 6
- AVMS on July 27
- RBCCW on September 9

Unit 3

- Controlled building chill water on September 1

b. Findings

Introduction. The inspectors identified a Green NCV of 10 CFR 50.65(b)(1), for Dominion's failure to include the safety-related Unit 2 AVMS SSC within the scope of the maintenance rule program. Specifically, Dominion removed the Millstone Unit 2 AVMS, which is required to remain functional during and following a design bases event to provide indication to operators in the control room of significant abnormal degradation of the reactor coolant pressure boundary and monitor for loss of coolant due to an open safety relief valve, from the scope of the maintenance rule monitoring program.

Description. The pressurizer safety relief valve acoustic monitors are safety-related post-accident instruments which provide indication to operators in the control room of significant abnormal degradation of the reactor coolant pressure boundary and monitor for loss of coolant due to an open safety relief valve in accordance with the requirements of Millstone Unit 2 TS 3.3.3.8, Accident Monitoring, and commitments made to conform with the guidance of Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," Revision 2. Millstone Unit 2 UFSAR states that this valve monitoring system conforms with NUREG-0578, "TMI-2 Lessons Learned Task Force Status Report and Short-Term Recommendations," which indicates the purpose of this system is "to provide the operator a more positive indication of valve position and therefore provide additional assurance that the integrity of the reactor coolant pressure boundary can be maintained or a loss of integrity directly diagnosed."

The inspectors reviewed the performance and maintenance history of Unit 2 AVMS. Within the monitoring period, Dominion generated CR1043240 and CR1036393 due to failure of each channel during surveillance testing. The failures observed have resulted in the complete loss of availability and reliability of each channel of AVMS such that they cannot perform their intended function. The inspectors selected Dominion's maintenance rule functional failure evaluations associated with CR1043240 and CR1036393 for review. However, instead of establishing whether or not a functional failure occurred when the channels of AVMS failed surveillance testing, Dominion changed the evaluation assignment to instead determine if the AVMS should remain in

scope of the maintenance rule program. Over the course of June and July MREP meetings, the group determined that “[t]hese instruments do not have an EOP function and do not have a safety related function...” Hence, MREP removed the safety-related post-accident instrumentation, AVMS, from the Unit 2 maintenance program scope.

Consistent with the NRC Enforcement Manual Section 2.1.11.E.3, the inspectors identified the removal of the safety-related AVMS from the maintenance rule program as contrary to 10 CFR 50.65(b)(1) which establishes that safety-related SSCs that are relied upon to ensure the integrity of the reactor coolant pressure boundary are included within the scope of monitoring. Dominion has incorporated this requirement within ER-AA-MRL-100, “Implementing Maintenance Rule,” Revision 10, Attachment 1, Maintenance Rule Logic Diagram and Attachment 2, Scoping and Risk Significance Determination. Attachment 1 provides the program implementing flow chart from NUMARC 93-01, “Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants,” Revision 4, which identifies that safety-related SSCs are within the scope of the maintenance rule (step 8.2.1.1); Attachment 2 provides this information as text steps 3.1.7 and 3.1.8 wherein safety-related functions are identified and associated SSCs are then captured within the scope of the program. Dominion has documented this condition within their CAP as CR1049493.

Analysis. The inspectors found that Dominion’s failure to include the safety-related AVMS within the scope of maintenance rule program monitoring contrary to 10 CFR 50.65(b)(1), was a performance deficiency within Dominion’s ability to foresee and correct. This performance deficiency was considered to be more than minor because it was associated with the equipment performance attribute of the Initiating Events cornerstone and adversely affected the objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, Dominion removed Unit 2 AVMS, a safety-related system comprised of post-accident instruments which provide indication to operators in the control room of significant abnormal degradation of the reactor coolant pressure boundary and monitor for loss of coolant due to an open safety relief valve, from the scope of the maintenance rule monitoring program and the failures observed have resulted in the complete loss of availability and reliability of each channel of AVMS such that they cannot perform their intended function. The finding was evaluated in accordance with IMC 0609, Appendix A, “The Significance Determination Process for Findings At-Power,” and determined to be of very low safety significance (Green) because the conditions associated with the most applicable design basis event are bound by the small break LOCA analysis and did not affect other systems used to mitigate a LOCA. This finding has a cross-cutting aspect in the Human Performance cross-cutting area associated with Procedure Adherence, in that MREP members did not follow the Dominion maintenance rule program implementing procedure, ER-AA-MRL-100, which provides guidance for scoping systems into the maintenance rule. [H.8]

Enforcement. 10 CFR 50.65(b)(1) states, in part, “(b) The scope of the monitoring program specified in paragraph (a)(1) [the maintenance rule monitoring program] of this section shall include safety-related ... structures, systems, and components, as follows: (1) Safety-related structures, systems and components that are relied upon to remain functional during and following design basis events to ensure the integrity of the reactor coolant pressure boundary...” Contrary to the above, from July 19, 2016, to present, Dominion did not include within the scope of their maintenance rule monitoring program the safety-related post-accident AVMS which provides indication to operators in the

control room of significant abnormal degradation of the reactor coolant pressure boundary to ensure the integrity of the reactor coolant system. Because this issue is of very low safety significance (Green) and Dominion has entered this issue into their CAP as CR1049493, this finding is being treated as an NCV consistent with the NRC Enforcement Policy Section 2.3.2.a. **(NCV 05000423/2016003-02, Failure to Scope Safety Related Acoustic Valve Monitoring System into the Maintenance Rule)**

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 7 samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that Dominion performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that Dominion personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When Dominion performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the TS requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

Unit 2

- Emergent change in risk state due to vital DC switch gear cooling maintenance scope expansion, 'C' RBCCW pump overhaul, and concurrent 'A' EDG surveillance testing on July 13
- Yellow Risk for inoperability of the 'B' RBCCW train during 'C' RBCCW pump suction header restoration on August 9
- Elevated risk due to online 'B' EDG overspeed testing on August 10
- Elevated risk due to emergent maintenance on M22-RB-13.1A, shutdown cooling heat exchanger outlet stop valve on August 30
- Elevated risk due to switchyard output breaker 9T open for breaker trip modification on September 22
- Elevated risk during containment entry at power to add oil to 'A' RCP on September 27

Unit 3

- Elevated risk due to charging system filter 4 (3CHS*FLT4) replacement on September 1

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 10 samples)

a. Inspection Scope

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

Unit 2

- Refueling water storage tank to high pressure safety injection suction isolation valve not operable following failure of air operated valve supply air filter on July 6
- Turbine driven auxiliary feedwater operable but not in compliance with Technical Requirements Manual on July 8
- Target Rock Part 21 functionality assessment on July 14
- Degraded feedwater isolation valves on September 15

Unit 3

- Potential vulnerability related to Unit 3 control switches in “pull-to-lock” on September 20
- Reactor coolant system leaking into ‘D’ SI accumulator through check valve (Operator workaround sample) on September 27
- Loose parts monitor channel 754 in alarm on July 1
- Equipment qualification of components in the main steam valve building due to elevated temperatures on July 20
- Radiation monitor 60B inoperable on July 18
- ‘A’ and ‘B’ EDG ventilation actuator oil leaks on July 26

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

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 2 samples).1 Temporary Modificationsa. Inspection Scope

The inspectors reviewed the temporary modification listed below to determine whether the modification affected the safety functions of systems that are important to safety. The inspectors reviewed 10 CFR 50.59 documentation and post-modification testing results, and conducted field walkdowns of the modifications to verify that the temporary modification did not degrade the design bases, licensing bases, and performance capability of the affected systems.

- Unit 2 procedurally controlled temporary modification for 'C' RBCCW pump isolation on July 13
- Unit 3 temporary SI accumulator fill system rig on July 16

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 5 samples)a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed the test procedure to verify that the procedure adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure were consistent with the information in the applicable licensing basis and/or design basis documents, and that the test results were properly reviewed and accepted and problems were appropriately documented. The inspectors also walked down the affected job site, observed the pre-job brief and post-job critique where possible, confirmed work site cleanliness was maintained, and witnessed the test or reviewed test data to verify quality control hold points were performed and checked, and that results adequately demonstrated restoration of the affected safety functions.

Unit 2

- 'C' RBCCW restoration following heat exchanger cleaning on July 19
- 'B' RBCCW pump following restoration of procedurally controlled temporary modification for 'C' RBCCW pump isolation on July 26
- 'B' high pressure safety injection pump and check valve testing following breaker maintenance on August 2
- 'A' RCP after filling upper bearing oil reservoir at power on September 27

Unit 3

- 'B' containment CDS chiller on August 1

b. Findings

No findings were identified.

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

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs to assess whether test results satisfied TSs, the UFSAR, and Dominion procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

Unit 2

- SP 2661B, 'B' EDG overspeed trip test on August 10
- SP 2611A, 'A' RBCCW pump (IST) on August 22
- STI-M2-2015-003, Reactor protection system surveillance frequency change on August 25

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness1EP6 Drill Evaluation (71114.06 – 1 sample)Emergency Preparedness Drill Observationa. Inspection Scope

The inspectors evaluated the conduct of a routine Dominion EP drill on August 1 to identify any weaknesses and deficiencies in the classification and notification recommendation development activities. This training drill involved operators classifying events on Unit 2 related to an unisolable excess steam demand event on a steam generator followed by a steam generator tube rupture. The inspectors observed emergency response operations in the Technical Support Center to determine whether Dominion performed emergency response organization actions in accordance with procedures. The inspectors also attended the station drill critique to compare inspector observations with those identified by Dominion staff in order to evaluate Dominion's critique and to verify whether Dominion staff was properly identifying weaknesses and entering them into the CAP.

b. Findings

No findings were identified.

2. **RADIATION SAFETY**

Cornerstone: Occupational and Public Radiation Safety

2RS4 Occupational Dose Assessment (71124.04 – 5 samples)

a. Inspection Scope

The inspectors reviewed the monitoring, assessment, and reporting of occupational dose. The inspectors used the requirements in 10 CFR 20, Regulatory Guides 8.9 and 8.34, TSs, and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed radiation protection program audits, National Voluntary Laboratory Accreditation Program (NVLAP) dosimetry testing reports, and procedures associated with dosimetry operations.

Source Term Characterization (1 sample)

The inspectors reviewed the plant radiation characterization (including gamma, beta, alpha, and neutron) being monitored. The inspectors verified the use of scaling factors to account for hard-to-detect radionuclides in internal dose assessments.

External Dosimetry (1 sample)

The inspectors reviewed dosimetry NVLAP accreditation, onsite storage of dosimeters, the use of “correction factors” to align electronic personal dosimeter results with NVLAP dosimetry results, dosimetry occurrence reports, and CAP documents for adverse trends related to external dosimetry.

Internal Dosimetry (1 sample)

The inspectors reviewed internal dosimetry procedures, whole body counter measurement sensitivity and use, adequacy of the program for whole body count monitoring of plant radionuclides or other bioassay technique, adequacy of the program for dose assessments based on air sample monitoring and the use of respiratory protection, and internal dose assessments for any actual internal exposure.

Special Dosimetric Situations (1 sample)

The inspectors reviewed Dominion’s worker notification of the risks of radiation exposure to the embryo/fetus, the dosimetry monitoring program for declared pregnant workers, external dose monitoring of workers in large dose rate gradient environments, and dose assessments performed since the last inspection that used multi-badging, skin dose, or neutron dose assessments.

Problem Identification and Resolution (1 sample)

The inspectors evaluated whether problems associated with occupational dose assessment were identified at an appropriate threshold and properly addressed in the CAP.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Mitigating Systems Performance Index (10 samples)

a. Inspection Scope

The inspectors reviewed Dominion's submittal of the Mitigating Systems Performance Index for the following systems for the period of July 1, 2013, through June 30, 2016:

- Unit 2 Emergency AC Power System
- Unit 3 Emergency AC Power System
- Unit 2 High Pressure Injection System
- Unit 3 High Pressure Injection System
- Unit 2 Heat Removal System
- Unit 3 Heat Removal System
- Unit 2 Residual Heat Removal System
- Unit 3 Residual Heat Removal System
- Unit 2 Cooling Water System
- Unit 3 Cooling Water System

To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspectors also reviewed Dominion's operator narrative logs, CRs, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 1 semi-annual trend sample; 2 annual samples)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, “Problem Identification and Resolution,” the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that Dominion entered issues into the CAP at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP and periodically attended CR screening meetings.

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a semi-annual review of site issues, as required by Inspection Procedure 71152, “Problem Identification and Resolution,” to identify trends that might indicate the existence of more significant safety issues. In this review, the inspectors included repetitive or closely-related issues that may have been documented by Dominion outside of the CAP, such as trend reports, performance indicators, major equipment problem lists, system health reports, maintenance rule assessments, and maintenance or CAP backlogs. The inspectors also reviewed Dominion’s CAP database for 2016 to assess CRs written in various subject areas (equipment problems, human performance issues, etc.), as well as individual issues identified during the NRCs daily CR review (Section 4OA2.1). Inspectors selected a series of Millstone Power Station Equipment Reliability Top 10 Focus Lists to determine if Dominion has established a non-quality problem identification and resolution process outside of the corrective action process which could adversely impact the capability of the station to identify and correct conditions adverse to quality.

b. Findings and Observations

No findings were identified.

Equipment Reliability Top 10 lists are posted onsite to inform staff of management’s equipment reliability priorities and issue owners. This program was established in March 2015 and the list has undergone four revisions since then, with the latest in May 2016. The inspectors observed that the program is managed through Plant Health Steering Committee, a cross disciplinary board of station leadership comprised of Operations, Maintenance, Engineering, and support organizations chaired by Site Engineering, but has few administrative requirements or procedural controls. This group develops the listing using the Plant Health Issues List, operating experience, and performance

indicators and, then, submits it to the Site Vice President for final review and approval prior to communication to the station at large.

While this is not a formalized Dominion program, Millstone has found success in using this tool to communicate priorities to the staff. The inspectors found that plant staff were widely aware of these issues and that they were consistent with the day to day equipment reliability concerns of the staff. When inspectors asked staff how to provide feedback on this list if they felt that there was an equipment reliability issue that should be addressed, some people were not specifically aware of how to bring an issue up through Plant Health Steering Committee. However, all staff stated that they would start the process by generating a CR and discussing their concern with their immediate supervisor, as required by Dominion's CAP. Inspectors observed there were some gaps in the staff's knowledge of resolution of issues recently removed from the Top 10 Focus List. Station management identified that formal communication of issues removed from the Top 10 Focus List is not necessarily performed in all cases.

The inspectors observed two examples of conditions on the Equipment Reliability Top 10 list that were not being tracked to closure by the CAP: Unit 2 Open Phase Detection and Unit 2 Loose Parts Monitor. These conditions did not meet Dominion's criteria for conditions adverse to quality that would require a CR. The inspectors also found three instances in which conditions were removed from the Equipment Reliability Top 10 list prior to issue completion: Unit 3 Service Water Booster Pumps (P2A/B & P3A/B), Unit 2 Pressurizer PORVs, and Unit 3 CCP Heat Exchangers. However, open CAP actions continue to track resolution in these cases. Based upon this review, the inspectors have determined that the Equipment Reliability Top 10 list that Dominion does not represent a program which adversely impact the capability of the CAP to perform its problem identification and resolution functions. Millstone has observed success in communicating equipment reliability issues prioritized by management to the station at large.

.3 Annual Sample: Untimely Emergency Declarations

a. Inspection Scope

During the fall of 2015, Millstone Units 2 and 3 both had untimely classifications of actual events. On October 4, 2015, Unit 2 initiated CR1011898 to document an untimely Unusual Event classification due to a reactor coolant system leak in excess of the emergency action level. On November 4, 2015, Unit 3 initiated CR1017050 to document an untimely classification of an Unusual Event due to a fire in the 'A' EDG room for Unit 3. The untimely classifications were documented as license-identified violations of 10 CFR Part 50, Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," in NRC Inspection Reports 0500336/2015012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16005A343), dated January 5, 2016, 0500036/2015004 (ADAMS Accession No. ML16035A119) and 05000423/2015004 (ADAMS Accession No. ML16035A119), dated February 4, 2016. A common cause evaluation was then performed for both events to determine their common cause and contributing causes, and assign appropriate corrective actions.

The inspectors reviewed Dominion's evaluation of, and corrective actions for, the problems encountered in the fall of 2015 with regards to untimely classifications and reviewed any past drill and exercise performance (DEP) issues. The inspectors

interviewed Millstone EP staff responsible for the common cause evaluation and EP related training; reviewed DEP simulator scenarios; and assessed the common cause report performed by Dominion in association with CR1017050. The focus of the inspection was to verify the evaluation and to ensure the corrective actions were appropriate and timely.

a. Findings and Observations

No findings were identified.

The inspectors reviewed Dominion's common cause evaluation report for CA3015580 to review the untimely event classifications. Dominion determined that the primary cause for the untimely classifications was due to a combination of factors that included a lack of sufficient EP related training for the operating crews and a lack of crew teamwork and communication during events. The inspectors reviewed the corrective actions implemented following the common cause evaluation which included increased EP focused training for the operating crews, assigning a member of the EP staff to participate in the weekly simulator training, and reinforcing the standards and expectations for the operating crews with regards to EP station standards.

Dominion's immediate and long term corrective actions were determined to be effective as evidenced by recording a high percentage of DEP scores for classification since the completion of the common cause evaluation. However, there was a lack of detailed documentation with regards to four of the corrective actions assigned to the common cause report. The four corrective actions were marked as cancelled with no supporting documentation as to why they were cancelled. This did not impact the efficacy or completeness of the corrective actions as a whole, but rather was a documentation issue. This performance deficiency was minor in nature and did not significantly impact the completion of the corrective actions that are addressed the common cause report.

.4 Annual Sample: Review of the Operator Workaround Program (1 sample)

a. Inspection Scope

The inspectors reviewed the cumulative effects of the existing operator workarounds, operator burdens, operator distractions and disabled/lit alarms, and open main control room deficiencies to identify any effect on emergency operating procedure operator actions, and any impact on possible initiating events and mitigating systems. The inspectors evaluated whether station personnel had identified, assessed, and reviewed operator workarounds as specified in Dominion procedure OP-AA-1700, "Operations Aggregate Impact."

The inspectors reviewed Dominion's process to identify, prioritize, and resolve main control room distractions to minimize operator burdens. The inspectors reviewed the system used to track operator workarounds. The inspectors also toured the control room and discussed the current operator workarounds with the operators to ensure the items were being addressed on a schedule consistent with their relative safety significance.

b. Findings and Observations

No findings were identified.

The inspectors determined that the issues reviewed did not adversely affect the capability of the operators to implement abnormal or emergency operating procedures. The inspectors also verified that Dominion entered operator workarounds and burdens into the CAP at an appropriate threshold and planned or implemented corrective actions commensurate with their safety significance.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 2 samples)

.1 Plant Events

a. Inspection Scope

For the plant events listed below, the inspectors reviewed and/or observed plant parameters, reviewed personnel performance, and evaluated performance of mitigating systems. The inspectors communicated the plant events to appropriate regional personnel, and compared the event details with criteria contained in IMC 0309, "Reactive Inspection Decision Basis for Reactors," for consideration of potential reactive inspection activities. As applicable, the inspectors verified that Dominion made appropriate emergency classification assessments and properly reported the event in accordance with 10 CFR Parts 50.72 and 50.73. The inspectors reviewed Dominion's follow-up actions related to the events to assure that Dominion implemented appropriate corrective actions commensurate with their safety significance.

- Unit 2 manual reactor trip in response to degraded condenser vacuum as a result of the loss of 'A' and 'C' circulating water pumps on August 11

b. Findings

No findings were identified.

.2 (Closed) Licensee Event Report (LER) 05000336/2015-003-00: Valid Actuation of the Reactor Protection System

On November 8, 2015, plant operators manually tripped the reactor due to an oil leak on the 'C' RCP motor lower oil reservoir. After operators received indication of RCP oil level dropping at 1.7 percent per hour and the lower RCP guide bearing temperatures rising, the operators entered the alarm response procedure for low RCP 'C' lower oil reservoir level. That procedure instructed operators to either trip the reactor on rapidly lowering oil level or start a controlled plant shutdown for slowly lowering oil level. Instead, operators entered the abnormal operating procedure for a rapid downpower and commenced a rapid downpower from 57.5 percent to 19 percent power before manually tripping the unit. The inspectors noted that while the alarm response procedure did not give the option to enter the abnormal operating procedure, this issue is minor due to there being a procedural pathway to get to that abnormal operating procedure through steps entered from the alarm response procedure. The cause of the oil leak was determined to be high cyclic fatigue of the tubing. After making repairs to the tubing, Dominion restarted the unit. This LER is closed.

4OA6 Meetings, Including Exit

On October 5, 2016, the inspectors presented the inspection results to Mr. John Daugherty, Site Vice President, and other members of the Millstone staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

ATTACHMENT: SUPPLEMENTARY INFORMATION

**SUPPLEMENTARY INFORMATION
KEY POINTS OF CONTACT**

Licensee Personnel

J. Daugherty, Site Vice President
C. Olsen, Plant Manager
L. Armstrong, Director, Performance Recovery
R. Borchart, Senior Reactor Engineer
B. Bowen, Shift Supervisor, Health Physics
M. Bradley, Manager, Radiation Protection and Chemistry
F. Cietek, Risk Analyst
T. Cleary, Licensing
G. Cochran, Supervisor, Nuclear Site Safety
C. DeBiasi, Chemistry Technician
D. DelCore, Shift Supervisor, Health Physics
D. Dodson, Manager of Programs
M. Dunivan, Supervisor, Health Physics Auxiliary Building
K. Gannon, Supervisor, Health Physics
J. Glaub, Chemistry Technician
T. Gleason, Radiation Protection Technician
L. Lebaron, System Engineer
K. Miles, Shift Supervisor, Health Physics
J. Nelson, Health Physicist
T. Olsowy, Licensing
R. Parrette, Operations
D. Smith, Site Emergency Preparedness Manager
M. Bradley, Manager, Radiation Protection and Chemistry
A. Briggs, Engineering Supervisor
B. Wilkens, EP Specialist
B. Faye, System Engineer
D. Rowe, Unit 3 Operations

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATEDOpened/Closed

| | | |
|-------------------------|-----|---|
| 05000336,423/2016003-01 | NCV | Failure to Review Standing Orders (Section 1R11) |
| 05000423/2016003-02 | NCV | Failure to Scope Safety Related Acoustic Valve Monitoring System into the Maintenance Rule (Section 1R12) |

Closed

| | | |
|----------------------|-----|---|
| 05000336/2015-003-00 | LER | Valid Actuation of the Reactor Protection System (Section 4OA3) |
|----------------------|-----|---|

LIST OF DOCUMENTS REVIEWED**Section 1R01: Adverse Weather Protection**Procedures

AOP 2560, Storms, High Winds, High Tides, Revision 016
 AOP 3569, Severe Weather Conditions, Revision 022
 AOP3577, Loss of Normal and Off-Site Power to a 4.16kV Emergency Bus, Revision 3

Section 1R04: Equipment AlignmentProcedures

OP-2330A, RBCCW System, Revision 026-00
 OP-2330A, RBCCW System Alignment, Facility 2, Revision 001-00
 OP-2330A, 'A' Pump is Supplying 'A' HX and 'B' Pump is Supplying 'C' HX with 24D Supplying 24 E, Revision 000-00
 OP 3330E-002, Safety Injection Pump Cooling System Valve Lineup – Train B, Revision 005
 SP 3608.4, High Pressure Safety Injection Valve Lineup Verification – Train B, Revision 000-03
 OP 3309 Quench Spray, Revision 014
 OP 3308, High Pressure Safety Injection, Revision 012-01
 OP 3330E, Safety Injection Pump Cooling System, Revision 008
 ER-AP-BAC-10, Boric Acid Control Program, Revision 12

Condition Reports

1036899
 1038003
 1040256
 1042421

Drawings

25203-26022, Sheet 1 PI&D Reactor Building Component Cooling Water Pumps and Heat Exchangers, Revision 45

25203-26022, Sheet 2 PI&D Reactor Building Component Cooling Water Pumps and Heat Exchangers, Revision 26

25212-26916, Sheet 1 PI&D Emergency Diesel Generator A Lube Oil and Cooling Water, Revision 46

25212-26916, Sheet 1 PI&D Emergency Diesel Generator A Starting Air System, Revision 39

25212-26904, Sheet 1 PI&D Chemical & Volume Control, Revision 54

25212-26904, Sheet 2 PI&D Chemical & Volume Control, Revision 17

25212-26904, Sheet 3 PI&D Chemical & Volume Control, Revision 32

25212-26904, Sheet 4 PI&D Chemical & Volume Control, Revision 30

25212-26905, Sheet 1 PI&D Chemical & Volume Control, Revision 23

1301055-M-25212-26903, PI&D Reactor Coolant Pump Seals, Revision 6

Miscellaneous

Unit 2 Control Room Operations Log

Unit 3 Control Room Operations and Engineering Logs

Section 1R05: Fire Protection

Procedures

U2-24-FFS-BAP01-INT, MSP2 Fire Fighting Strategies, Fire Area A-1B, Reactor Building Component Cooling Water and Heat Exchanger Area, Revision 0

U2-24-FFS-BAP01-INT, MSP2 Fire Fighting Strategies, Fire Area A-15, Diesel Generator A Cubicle, Revision 0

U2-FFS-BAP01-INT, MSP2 Fire Fighting Strategies, Fire Area T-1F, Operating Floor/Turbine Deck, Revision 0

U2-FFS-BAP01-INT, MSP2 Fire Fighting Strategies, Fire Area A-8A, Safeguards Room SA-AA-115, Conduct of Fire Drills, Revision 2

CM-AA-FPA-100, Fire Protection/Appendix R (Fire Safe Shutdown) Program, Revision 11

U3-24-FFS-BAP01-ESF-MAP, ESF B Motor Driven Auxiliary Feed Water pump 24 Ft and ESF 36 Ft, Revision 0

U3-24-FFS, Millstone Unit 3 Nuclear Power Station MP3 Fire Fighting Strategies, Revision 0

AOP 2579C, Fire Procedure for Hot Standby Appendix R Fire Area R-3, Revision 006-00

U3-24-FFS-BAP01-EG, A & B Diesel Generator Enclosure, Revision 0

Condition Reports

CR1049408

CR1049092

CR1042615

CR1042244

Miscellaneous

Millstone Unit 3 Fire Protection Evaluation Report, Revision 21.3

Millstone Unit 2 Fire Hazard Analysis, Revision 11

Section 1R06: Flood Protection Measures

Procedures

MPS-3 Updated Final Safety Analysis Report

Condition Reports

1042026
1045760
CR1049038
CR1047810

Miscellaneous

PID 25203-26011, Sheet 1, Fire Protection, Revision 57
Millstone Unit 2 Emergency Action Level Technical Basis Document, Revision 024
Millstone Unit 2 Appendix R Compliance Report, Revision 01

Section 1R07: Heat Sink Performance

Procedures

AOP 2565, Loss of Service Water, Revision 6
SP 3626.13, Service Water Heat Exchangers Fouling Determination, Revision 22
EN 31084, Operating Strategy for Service Water System at Millstone Unit 3, Revision 8
SP 2670, Saltwater Cooled HX D/P Determination, Revision 14
MP 2701J-096, Service Water Cooled Heat Exchangers Subject to GL 89-13, Revision 8
EN 21221, MP2 Check Valve Inspections, Revision 7
SP 2612B, "C" Service Water Pump Tests, Revision 13
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SP2612A, "A" SW Pump and Facility 1 Discharge Check Valve IST, dated November 15, 2015
SP2612A, "A" SW Pump and Facility 1 Discharge Check Valve IST, dated May 9, 2016
SP2612A, "A" SW Pump and Facility 1 Discharge Check Valve IST, dated March 13, 2016
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12-328, Equivalent Thermal Performance of the Unit 2 EDG Heat Exchangers for UHS Temperature Increase, Revision 0
98-119, MP2 EDG Heat Exchanger Thermal Performance Test Analysis, Revision 0
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| | | | |
|-------------|-------------|-------------|-------------|
| 53102800130 | 53102571757 | 53102572586 | 53102576771 |
| 53102355180 | 53102429673 | 53102429681 | 53102458629 |
| 53102429681 | 53102602570 | 53102429691 | 53102611053 |
| 53102612165 | 53102648568 | 53102972914 | 53102708765 |
| 53102800130 | 53102430444 | 53102804663 | 53103003806 |
| 53102845700 | 53102830629 | 53102834740 | 53102843018 |
| 53102640471 | 53102710444 | 53102830575 | 53102700104 |
| 53102915274 | 53102713842 | | |

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|---------|---------|---------|
| 538259 | 538274 | 538282 |
| 543294 | 544635 | 544640 |
| 544659 | 544700 | 544701 |
| 544779 | 544783 | 544785 |
| 544786 | 544792 | 544795 |
| 544835 | 547170 | 557424 |
| 557433 | 564063 | 569509 |
| 575328 | 576130 | 577775 |
| 577853 | 579354 | 579761 |
| 1005016 | 1013009 | 1013032 |
| 1013042 | 1013114 | 1013114 |
| 1013162 | 1013351 | 1013856 |
| 1028640 | 1034988 | 1035100 |
| 1040406 | | |

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AOP 2575, Rapid Downpower, Revision 009
EOP 2526, Reactor Trip Recovery, Revision 019
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1045031
1045027

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| 1049493 | 1042275 | 1003985 |
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| 1020670 | 1022271 | 1024788 |
| 1034241 | 1034340 | 1037022 |
| 1044687 | 1044700 | |

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1045207

1045982

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53102998736

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OP-AA-102, Operability Determinations, Revision 14
 OP 3250, Removing Equipment from Service, Revision 015
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| | | |
|---------|---------|---------|
| 1039453 | 1037907 | 1041001 |
| 1041883 | 1041961 | 1041962 |
| 1041785 | 1045356 | 1041054 |
| 1039048 | 1040739 | 1046492 |
| 1042848 | 1042735 | 1037341 |
| 1043664 | 1042522 | 1014389 |
| 555456 | 5544765 | 1043211 |

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53102702038
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 53103000876

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 CA 3032041, ODM for 3SIL*TK1D, Safety Injection Accumulator Tank, dated May 23, 2016
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 PID 25203-26005, Sheet 2, Feed System, Revision 68
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 AOP 2564, Loss of RBCCW, Revision 004-06
 SP 2670-003, "C" RBCCW HX D/P Determination, Revision 001-04
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|---------|---------|---------|
| 1043502 | 1015406 | 1042361 |
| 1049408 | 1049092 | 1044004 |

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| 53102935488 | 53102860353 | 53102948371 |
| 53102922118 | 53102644583 | 53102986913 |
| 53102991333 | 53102989179 | |

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53102690506

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 EOP 2525, Standard Post Trip Actions, Revision 027
 EOP 2536, Excess Steam Demand Event, Revision 026-001
 OP 3315E, Technical Support Center Ventilation, Revision 003-04

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|---------|---------|---------|
| 1043872 | 1043870 | 1043869 |
| 1043867 | 1043866 | 1043865 |

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 Operating Nuclear Plants Rev 2", SAR002778, dated 6/30/2015

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Urine Analysis Results, Teledyne Brown Engineering, LIMS # L68586, dated 6/30/2016 (tritium)

Whole Body Count Log

Whole Body Count Report, Plant ID 53743, dated 5/5/2016 at 1504

Whole Body Count Report, Plant ID 53750, dated 5/6/2016 at 0918

Whole Body Count Report, Plant ID 53750, dated 5/5/2016 at 1450

Whole Body Count Report, Plant ID 70718, dated 6/8/2016 at 0754

Section 4OA1: Performance Indicator VerificationMiscellaneous

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 Residual Heat Removal, and Cooling Water System inputs

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OP-AA-1700, Operations Aggregate Impact, Revision 6
 OP-AA-100, Performance Monitoring, Revision 9
 OP-AA-100-1000, Performance Indicators, Revision 5
 PI-AA-200, Corrective Action, Revision 29

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|---------|---------|---------|
| 333933 | 384659 | 416266 |
| 493668 | 496468 | 501917 |
| 534572 | 567219 | 581395 |
| 1001117 | 1003474 | 1005257 |
| 1005482 | 1011898 | 1017050 |
| 1017078 | 1022731 | 1037071 |
| 1037072 | 1037729 | 1037746 |
| 1037928 | 1041394 | 1041676 |
| 1043227 | | |

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 Millstone Power Station Operation Focus Report, dated August 2, 2016
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 CA3028739, C RBCCW Pump Bearing Leak
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 Unit 2 Compensatory Action/Temporary System Log, dated August 17, 2016
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 ACE017509
 CA3005397
 CA135842

Section 40A3: Follow-up of Events and Notices of Enforcement Discretion

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 AOP 2586, RCP Malfunctions, Revision 001
 ARP 2590B-149, RCP C LWR OIL RSVR LEVEL LO, Revision 000-02
 ARP 2590B-149, RCP C LWR OIL RSVR LEVEL LO, Revision 001
 ARP 2590B-157, RCP C LOWER GUIDE TEMP HI, Revision 000
 ARP 2590B-157, RCP C LOWER GUIDE TEMP HI, Revision 001
 OP 2204, Load Changes, Revision 030
 OP 2204, Load Changes, Revision 034
 PI-AA-200, Corrective Action, Revision 30
 OP-AA-100, Conduct of Operations, Revision 31
 OP 2202, Reactor Startup ICCE, Revision 024
 OP2202A, Reactor Startup by Dilution ICCE, Revision 03
 OP 2203, Plant Startup, Revision 026

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|---------|---------|---------|
| 569327 | 1017568 | 1035792 |
| 1046026 | 1044529 | 1042287 |

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53102576777

Miscellaneous

Root Cause Evaluation 3015891, Unit 2 'C' RCP Oil Leak Causes Plant Shutdown

LIST OF ACRONYMS

| | |
|--------|---|
| 10 CFR | Title 10 of the <i>Code of Federal Regulations</i> |
| ADAMS | Agencywide Documents Access and Management System |
| AVMS | acoustic valve monitoring system |
| CAP | corrective action program |
| CR | condition report |
| DEP | drill and exercise performance |
| DRP | Division of Reactor Projects |
| DRS | Division of Reactor Safety |
| EDG | emergency diesel generator |
| EP | emergency preparedness |
| HELB | high energy line break |
| IMC | Inspection Manual Chapter |
| LER | licensee event report |
| LOCA | loss of coolant accident |
| MREP | Maintenance Rule Expert Panel |
| NCV | non-cited violation |
| NRC | Nuclear Regulatory Commission, U.S. |
| NVLAP | National Voluntary Laboratory Accreditation Program |
| RBCCW | reactor building component cooling water |
| RCP | reactor coolant pump |
| SI | safety injection |
| SSC | structure, system, and component |
| SW | service water |
| TDAFW | turbine driven auxiliary feedwater |
| TS | technical specification |
| UFSAR | Updated Final Safety Analysis Report |