



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION I  
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February 1, 2017

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

SUBJECT: MILLSTONE POWER STATION – INTEGRATED INSPECTION REPORT  
05000336/2016004 AND 05000423/2016004

Dear Mr. Stoddard:

On December 31, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Millstone Power Station (Millstone), Units 2 and 3. On January 25, 2017, 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 three findings of very low safety significance (Green) in this report, each of which involved violations of NRC requirements. Further, inspectors documented a licensee-identified violation of very low safety significance in this report. 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 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.

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 05000336/2016004 and  
05000423/2016004 w/Attachment:  
Supplementary Information

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Letter to Mr. Daniel G. Stoddard from Eugene M. DiPaolo dated February 1, 2017

SUBJECT: MILLSTONE POWER STATION – INTEGRATED INSPECTION REPORT  
05000336/2016004 AND 05000423/2016004

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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. 05000336/2016004 and 05000423/2016004

Licensee: Dominion Nuclear Connecticut, Inc. (Dominion)

Facility: Millstone Power Station, Units 2 and 3

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

Dates: October 1 through December 31, 2016

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

Enclosure

## TABLE OF CONTENTS

SUMMARY .....	3
REPORT DETAILS .....	6
1. REACTOR SAFETY .....	6
1R01 Adverse Weather Protection .....	6
1R04 Equipment Alignment .....	6
1R05 Fire Protection .....	8
1R07 Heat Sink Performance .....	10
1R11 Licensed Operator Requalification Program & Licensed Operator Performance .....	11
1R12 Maintenance Effectiveness .....	15
1R13 Maintenance Risk Assessments and Emergent Work Control .....	16
1R15 Operability Determinations and Functionality Assessments .....	17
1R19 Post-Maintenance Testing .....	17
1R22 Surveillance Testing .....	18
1EP4 Emergency Action Level and Emergency Plan Changes .....	19
1EP6 Drill Evaluation .....	19
2. RADIATION SAFETY .....	20
2RS1 Radiological Hazard Assessment and Exposure Controls .....	20
4. OTHER ACTIVITIES .....	21
4OA1 Performance Indicator Verification .....	21
4OA2 Problem Identification and Resolution .....	22
4OA3 Follow-up of Events and Notices of Enforcement Discretion .....	28
4OA5 Other Activities .....	29
4OA6 Meetings, Including Exit .....	38
4OA7 Licensee-Identified Violations .....	38
SUPPLEMENTARY INFORMATION .....	A-1
KEY POINTS OF CONTACT .....	A-1
LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED .....	A-2
LIST OF DOCUMENTS REVIEWED .....	A-2
LIST OF ACRONYMS .....	A-16

## SUMMARY

Inspection Report 05000336/2016004, 05000423/2016004; 10/01/2016 – 12/31/2016; Millstone Power Station (Millstone), Units 2 and 3; Fire Protection, Licensed Operator Requalification, and Problem Identification and Resolution.

This report covered a three-month period of inspection by resident inspectors and announced baseline inspections performed by regional inspectors. The inspectors identified three non-cited violations (NCVs), all of which were of very low safety significance (Green). Additionally, a licensee-identified violation, which was determined to be of very low safety significance (Green), is listed in this report. 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 November 1, 2016. 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 Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to adequately implement procedure MA-AA-105, "Scaffolding," Revision 17. Specifically, Dominion routinely failed to perform engineering evaluations of long term scaffolding installed in the plant for greater than 90 days. Dominion has documented this condition within their corrective action program (CAP) as condition report CR1049493.

The inspectors determined that this finding was more than minor as it represents the routine failure to perform 10 CFR 50.59 engineering evaluations consistent with the requirements of procedures MA-AA-105 and CM-AA-400 which if left uncorrected, would have the potential to lead to a more significant safety concern as informed by IMC 0612, Appendix E, "Examples of Minor Issues," example 4.a. The finding screened to be of very low safety significance (Green), when all screening questions were answered "No" as the conditions identified did not challenge safety system functions. This finding has a cross-cutting aspect in the Problem Identification and Resolution, cross-cutting area associated with Resolution, in that under CR1049057, Dominion did not take effective corrective action to resolve and correct the identified gaps in the tracking and assessment of scaffolding installed for greater than 90 days as directed by MA-AA-105 and CM-AA-400, resulting in three further failures to evaluate long term scaffolding identified by the inspectors in the Unit 2 'A' Safeguards Room. [P.3] (Section 1R05)

- Green. The inspectors identified an NCV of 10 CFR 55.49, "Integrity of Examinations and Tests," for the failure of the licensee to ensure that the integrity of an operating test administered to licensed operators was maintained. During the annual operating exam, 19 of the Unit 2 licensed operators received more than two of five job performance measures (JPMs) (>50 percent) for their operating tests that had been administered to other licensed operators in previous weeks of the same exam cycle. This failure resulted in a compromise of examination integrity because it exceeded the Dominion Nuclear Fleet Procedure TR-AA-730, "Licensed Operator Biennial and Annual Operating Requalification Exam Process,"

Revision 9, requirement to repeat less than or equal to 50 percent of the JPMs during the exam cycle. However, this compromise did not lead to an actual effect on the equitable and consistent administration of the examination. This issue was entered into Dominion's CAP as CR1056308.

The failure of Dominion's training staff to maintain the integrity of examinations administered to licensed operations personnel was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because if left uncorrected, the performance deficiency could have become more significant in that allowing licensed operators to return to the control room without valid demonstration of appropriate knowledge on the biennial examinations could be a precursor to a more significant event. Using IMC 0609, "Significance Determination Process," and the corresponding Appendix I, "Licensed Operator Requalification Significance Determination Process," the finding was determined to have very low safety significance (Green) because although the finding resulted in a compromise of the integrity of operating test JPMs and compensatory actions were not immediately taken when the compromise should have been discovered in 2016, the equitable and consistent administration of the test was not actually impacted by this compromise. This finding has a cross-cutting aspect in the area of Human Performance associated with Field Presence, because the licensee failed to ensure that deviations from standards and expectations are corrected promptly such that the 50 percent maximum limit on repeated JPMs was not exceeded. Specifically, Dominion supervisory review and approval of the original examination plan and subsequent changes to that plan could have discovered the deviation from standards and expectations. [H.2] (Section 1R11)

- 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 to replace degraded diodes in Unit 3 vital inverters INV-1 and INV-2 upon receipt of information that called their reliability into question. Specifically, following two inverter failures, Dominion had not taken any corrective actions to replace degraded diodes in the Unit 3 vital inverters from the receipt of the Exelon Power Labs report on September 20 until the susceptible diodes were inspected and replaced on November 17 and 22. Dominion entered this issue into their CAP as CR1041301.

The inspectors found that Dominion's failure to take timely corrective action to replace degraded vital inverter diodes was a performance deficiency within Dominion's ability to foresee and correct. This performance deficiency was considered to be more than minor because it would affect the Mitigating Systems cornerstone equipment performance attribute objective to ensure the availability and reliability of vital 120V power. Specifically, manufacturing defects in the diodes caused these subcomponents to fail when they were expected to last the life of the inverter. 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 although the failure challenged the reliability of the inverters, it did not result in a loss of operability or functionality. This finding has a cross-cutting aspect in the Human Performance cross-cutting area associated with Work Management, in that Dominion focused on managing the risk associated with voluntarily entering a 24 hour technical specifications (TS) limiting condition for operation (LCO) to replace the degraded diodes instead of the potential risk of another inverter failure. [H.5] (Section 4OA2)

**Other Findings**

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



## REPORT DETAILS

### Summary of Plant Status

Unit 2 and Unit 3 remained at or near 100 percent power for the duration of the inspection period.

## 1. REACTOR SAFETY

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

#### 1R01 Adverse Weather Protection (71111.01 – 2 samples)

##### Readiness for Seasonal Extreme Weather Conditions

##### a. Inspection Scope

The inspectors performed a review of Dominion's readiness for the onset of seasonal cold temperatures at Unit 2 and Unit 3. The review focused on protection for the safety-related equipment including condensate storage tanks, refueling water storage tanks, diesel generator fuel oil storage, as well as heating for the buildings. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), TS, control room logs, and the CAP to determine what temperatures or other seasonal weather could challenge these systems, and to ensure Dominion's personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including Dominion's seasonal weather preparation procedure and applicable operating procedures. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during cold weather conditions. Documents reviewed for each section of this inspection report are listed in the Attachment.

##### b. Findings

No findings were identified.

#### 1R04 Equipment Alignment

##### Partial System Walkdowns (71111.04 – 5 samples)

##### a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

##### Unit 2

- 25A, 24C, and 24A electrical buses during breaker 307 preventive maintenance with bus 24C protected on October 5
- Control rod drive automatic coil transfer mechanisms during off normal alignment of control element drive mechanism on December 13

### Unit 3

- Auxiliary feedwater system during 'A' motor driven auxiliary feedwater (MDAFW) planned maintenance on October 17
- Turbine driven auxiliary feedwater (TDAFW) pump emergency operating procedure restart/reset after tripping on November 7
- Safety injection high pressure pump 'A' train on November 9

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, TS, work orders, CRs, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted 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 November 29, the inspectors performed a complete system walkdown of the Unit 2 'A' emergency diesel generator (EDG) to verify the existing equipment lineup would allow for successful implementation of Dominion's operating procedures. The inspectors reviewed 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 walkdowns 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 – 6 samples)

#### a. Inspection Scope

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

#### Unit 2

- East and west direct current equipment rooms (Fire Areas A-20 and A-21) on October 31
- Auxiliary building 'A' safeguards room -45'-6" Elevation (Fire Area A-8A) on December 15
- Auxiliary building general area -5'-6" Elevation (Fire Area A-1G) on December 15

#### Unit 3

- East and west switchgear rooms (Fire Areas CB-16 and CB-17) on December 2
- Auxiliary building 66' (Fire Areas AB – 9) on December 23
- Lube oil storage room (Fire Area TB-1) on December 29

#### b. Findings

Introduction. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to adequately implement procedure MA-AA-105, "Scaffolding," Revision 17. Specifically, Dominion routinely failed to perform engineering evaluations of long term scaffolding installed in the plant for greater than 90 days.

Discussion. On December 15, 2016, during fire inspection of Millstone Unit 2 'A' safeguards room, inspectors discovered three scaffold locations which had been installed in the station for greater than 90 days but lacked the required engineering evaluation, 10 CFR 50.59 screening. Upon further review, the inspectors observed that Dominion had identified similar conditions in CR1049057 on September 29, 2016. Across the station, over 100 scaffolding locations failed to be tracked in accordance with the scaffold program such that long term scaffolding would carry the appropriate engineering evaluations for installation greater than 90 days. Dominion completed 10 CFR 50.59 screenings for identified locations on October 10, 2016. An additional corrective action was generated to evaluate long term scaffold tracking issues. This action was closed on October 31, 2016, based upon the generation of a tracking spreadsheet for long term and permanent scaffolding to be maintained by the nuclear site services scaffold coordinator. During review of MA-AA-105, the inspectors observed

that the tracking guidance provided is limited to the direction that the sites shall track scaffolding requests and scaffolding work orders with the work management scaffolding order or the site-specific scaffolding numbering. There is no discussion of long term monitoring.

Following the identification of three non-conforming scaffolding locations at Unit 2 by the inspectors, Dominion performed an extent of condition review discovering three additional locations at Unit 2 and five at Unit 3, each lacking engineering evaluations for installations greater than 90 days. The inspectors later performed a further sample inspection identifying two more non-conforming scaffolding locations at Unit 2 for installation greater than 90 days while one more was discovered at Unit 3 with an incomplete engineering evaluation for proximity to safety-related equipment.

MA-AA-105, Section 3.17, "Scaffolding Inspection," instructs Dominion staff to perform a monthly review of scaffolding logs to determine scaffolding that has been in place greater than 60 days. If scaffolding has been in place greater than 60 days at power and it is further expected to remain for greater than 90 days at power, the staff is directed to perform a 10 CFR 50.59 engineering evaluation in accordance with CM-AA-400, "10 CFR 50.59, and 10 CFR 72.48 – Changes, Tests, and Experiments," prior to the scaffolding being installed greater than 90 days. The inspectors found that contrary to these instructions, Dominion has routinely failed to perform engineering evaluations on scaffolding even after completion of corrective actions to resolve the identification in September 2016 that these activities were not being performed. Dominion has documented this condition within their CAP as CR1056068.

Analysis. The inspectors found that the failure to accomplish activities affecting quality as prescribed by documented instructions was a performance deficiency reasonably within Dominion's ability to foresee and prevent. Specifically, subsequent to completion of corrective actions associated with multiple failures to track scaffolding age and to perform 10 CFR 50.59 screenings of scaffolding installed greater than 90 days in accordance with procedures MA-AA-105 and CM-AA-400, Dominion routinely failed to perform 10 CFR 50.59 engineering evaluations for three additional scaffolding locations installed the Unit 2 'A' safeguards room for greater than 90 days. The inspectors determined that this finding was more than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," as it represents the routine failure to perform 10 CFR 50.59 engineering evaluations consistent with the requirements of procedures MA-AA-105 and CM-AA-400 which if left uncorrected, would have the potential to lead to a more significant safety concern. Specifically, this could result in the installation of an unevaluated structure which could have an adverse impact to safety significant functions during an event. In addition, this issue is similar to more than minor Example 4.a of IMC 0612, Appendix E, "Examples of Minor Issues," associated with the routine failure to perform engineering evaluations.

In accordance with IMC 0609, "Significance Determination Process," Attachment 4, "Initial Characterization of Findings," and IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," Section A, "Mitigating Systems, Structures or Components and Functionality," the finding screened to be of very low safety significance (Green), when all screening questions were answered "No" as the conditions identified did not challenge safety system functions.

The inspectors determined in accordance with IMC 0310, "Aspects within the Cross-Cutting Areas," dated December 4, 2014, that this finding had a cross-cutting aspect in the Problem Identification and Resolution cross-cutting area associated with Resolution, in that under CR1049057, Dominion did not take effective corrective action to resolve and correct the identified gaps in the tracking and assessment of scaffolding installed for greater than 90 days as directed by procedures MA-AA-105 and CM-AA-400, resulting in three further failures to evaluate long term scaffolding identified by the inspectors in the Unit 2 'A' Safeguards Room. [P.3]

Enforcement. 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," states, in part, "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, from September 2016 to present, Dominion did not accomplish activities affecting quality, the tracking of scaffolding installed greater than 90 days, and the screening of the same in accordance with 10 CFR 50.59, as prescribed by documented procedures MA-AA-105, "Scaffolding," and CM-AA-400, "10 CFR 50.59 and 10 CFR 72.48 – Changes, Tests, and Experiments." Because this issue was of very low safety significance (Green) and Dominion has entered this issue into their CAP [CR1056068], this finding is being treated as an NCV consistent with Section 2.3.2.a of the NRC Enforcement Policy. **(NCV 05000336/2016004-01 & 05000423/2016004-01, Routine Failure to Perform Engineering Evaluation of Long Term Scaffolding)**

1R07 Heat Sink Performance (711111.07A – 1 sample)

a. Inspection Scope

The inspectors reviewed the Unit 2 'A' EDG lubricating oil heat exchanger to determine its readiness and availability to perform its safety functions on December 12. The inspectors reviewed the design basis for the component and verified Dominion's commitments to NRC Generic Letter 89-13, "Service Water System Requirements Affecting Safety-Related Equipment." The inspectors observed maintenance as well as reviewed the results of inspections and chemistry sampling of the Unit 2 'A' EDG lubricating oil and similar heat exchangers. The inspectors discussed the results of the most recent inspection with engineering staff and reviewed pictures of the as-found and as-left conditions. The inspectors verified that Dominion initiated appropriate corrective actions for identified deficiencies. The inspectors also verified that the number of tubes plugged within the heat exchanger did not exceed the maximum amount allowed.

b. Findings

No findings were identified.

## 1R11 Licensed Operator Regualification Program and Licensed Operator Performance

### .1 Licensed Operator Regualification (71111.11A – 1 sample)

#### Unit 3

##### a. Inspection Scope

On December 23, 2016, an NRC region-based inspector conducted an in-office review of results of the Unit 3 licensee-administered annual operating test and biennial written exam for operators.

#### Examination Results

Regualification exam results (annual operating test and biennial written exam) for 2016 were reviewed to determine if pass/fail rates were consistent with the guidance of IMC 0609, Appendix I, "Operator Regualification Human Performance Significance Determination Process." The review verified that the failure rate (individual or crew) did not exceed 20 percent.

- The overall individual operator failure rate was 5.6 percent.
- The overall crew failure rate was 0.0 percent

##### b. Findings

No findings were identified.

### .2 Licensed Operator Regualification (71111.11B – 1 sample)

#### Unit 2

##### a. Inspection Scope

The following Unit 2 inspection activities were performed using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 10, and Inspection Procedure (IP) 71111.11, "Licensed Operator Regualification Program."

#### Examination Results

Regualification exam results (annual operating test and biennial written exam) for 2016 were reviewed to determine if pass/fail rates were consistent with the guidance of IMC 0609, Appendix I, "Operator Regualification Human Performance Significance Determination Process." The review verified that the failure rate (individual or crew) did not exceed 20 percent.

- The overall individual operator failure rate was 2.3 percent.
- The overall crew failure rate was 0.0 percent.

### Written Examination Quality

The inspectors reviewed two comprehensive written exams administered to the operators in October and November 2016.

### Operating Test Quality

The inspectors reviewed two annual operating tests (4 scenarios and 10 JPMs) associated with the on-site inspection week and the subsequent week.

### Licensee Administration of Operating Tests

The inspectors observed facility training staff administer dynamic simulator exams and JPMs. These observations included facility evaluations of crew and individual operator performance during the simulator exams and individual performance of JPMs.

### Exam Security

The inspectors assessed whether facility staff properly safeguarded exam material, and whether test item repetition was excessive.

### Remedial Training Program

The inspectors reviewed remediation packages, including re-tests, associated with operators who failed exams during the 2014-2016 two year cycle.

### Conformance with License Conditions

License reactivation and license proficiency records were reviewed to ensure that 10 CFR 55.53 license conditions and applicable program requirements were met. The inspectors also reviewed a sample of records for requalification training attendance and a sample of medical examinations for compliance with license conditions and NRC regulations.

### Simulator Performance

Simulator performance and fidelity were reviewed for conformance to the reference plant control room. A sample of simulator deficiency reports was also reviewed to ensure facility staff addressed identified modeling problems.

### Problem Identification and Resolution

The inspectors reviewed recent operating history documentation found in inspection reports, licensee event reports (LERs), Dominion's CAP, NRC end-of-cycle and mid-cycle reports, and the most recent NRC plant issues matrix. The resident staff was also consulted for insights regarding licensed operators' performance. The inspectors focused on events associated with operator errors that may have occurred due to possible training deficiencies.

b. Findings

Introduction. The inspectors identified a Green NCV of 10 CFR 55.49, "Integrity of Examinations and Tests," for Dominion's failure to maintain the integrity of an annual operating test administered to licensed operators. This resulted in the annual testing of multiple Unit 2 licensed operators with JPMs previously administered to other crews during the exam cycle, in excess of the limits established for JPM overlap.

Description. On December 20, 2016, while performing a biennial inspection in accordance with IP 71111.11, "Licensed Operator Requalification Program," the inspectors determined at least three licensed operators on Unit 2 were administered annual operating tests where more than 50 percent of their JPMs were previously administered to other licensed operators during preceding weeks of the same exam cycle (which ran from October through December 2016). After discussion with the inspectors, Dominion immediately performed an extent-of-condition review. This review revealed a total of 19 licensed operators on Unit 2 were administered exams where more than 50 percent of their JPMs (greater than two of the five JPMs administered to each operator) had been previously administered to other licensed operators during earlier weeks of the same exam cycle. Specifically, training personnel administered five JPMs to six of the operators, four JPMs to four of the operators, and three JPMs to nine of the operators that had been administered to other operators during previous exam weeks.

Dominion Nuclear Fleet Procedure TR-AA-730, "Licensed Operator Biennial and Annual Operating Requalification Exam Process," Revision 9, requires walkthrough examinations administered to different licensed operators during different weeks of the exam cycle repeat less than or equal to 50 percent of the NUREG-1021 JPMs that have previously been administered during the exam cycle. The inspectors concluded that failure to fulfill the requirements of this procedure constituted a compromise of examination integrity required by 10 CFR 55.49. Dominion subsequently selected and administered additional JPMs to the affected operators to replace other JPMs they had previously received and passed, thereby ensuring all 19 operators received a valid uncompromised exam prior to the end of the two-year requalification cycle. Dominion's preliminary review of the issue indicated that they failed to take the first week of the exam cycle into consideration when evaluating for excessive JPM overlap and also failed to identify excessive overlap created by exam plan changes made as a result of plant operating conditions that conflicted with the administration of the originally selected JPMs. Dominion will be conducting a formal analysis to fully understand and correct the causes.

The inspectors reviewed various items to ensure that examination security was effective at preventing an actual impact on examination integrity. The inspectors noted that Dominion training personnel performed a formal briefing to all operations personnel prior to the administration of their 2016 operating test which specifically prohibited them from discussing the details of their test with other personnel. Dominion and the inspectors also reviewed the grading of the 2016 operating tests to determine if there was any discernible discrepancy in evaluated performance between the different weeks that would indicate that the equitable and consistent administration of the test had actually been affected. During this review it was determined that a number of operators failed JPMs that had been administered to other crews in previous weeks. The inspectors concluded that although the integrity of the 2016 operating test was not maintained,



there was no actual effect on the equitable and consistent administration of the examination. Dominion documented this excessive exam overlap issue in CR1056308.

Analysis. The failure of Dominion's training staff to maintain the integrity of examinations administered to licensed operations personnel was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because if left uncorrected, the performance deficiency had the potential to lead to a more significant safety concern. Specifically, allowing operators to return to the control room without valid demonstration of appropriate knowledge on the biennial examinations could result in having less than adequately qualified operators manipulating plant controls in response to events. Using IMC 0609, "Significance Determination Process," and the corresponding Appendix I, "Licensed Operator Requalification Significance Determination Process," the finding was determined to have very low safety significance (Green) because although the finding resulted in a compromise of the integrity of operating test JPMs and compensatory actions were not immediately taken when the compromise should have been discovered in 2016, the equitable and consistent administration of the test was not actually impacted by this compromise. This finding had a cross-cutting aspect in the area of Human Performance associated with Field Presence because the licensee failed to ensure that deviations from standards and expectations are corrected promptly such that the 50 percent maximum limit on repeated JPMs was not exceeded. Specifically, Dominion supervisory review and approval of the original examination plan and subsequent changes to that plan could have discovered the deviation from standards and expectations. [H.2]

Enforcement. Title 10 CFR 55.49, "Integrity of Examinations," requires, in part, that facility licensees shall not engage in any activity that compromises the integrity of any application, test, or examination required by this part. The integrity of a test or examination is considered compromised if any activity, regardless of intent, affected, or, but for detection, could have affected the equitable and consistent administration of the test or examination. This includes activities related to the preparation, administration, and grading of the tests and examinations required by this part. Contrary to the above, during the 2016 annual examination cycle (late October through mid-December 2016), Dominion engaged in an activity that compromised the integrity of a test required by 10 CFR Part 55. Specifically, more than 50 percent of the JPMs administered by training personnel to each of 19 operators licensed on Unit 2 had been previously administered to other Unit 2 licensed operators during preceding weeks of the same exam cycle. Administering an operating test with greater than 50 percent overlap from previously administered operating tests is considered a compromise of the integrity of the test in that it is a practice that, but for detection, could affect the equitable and consistent administration of the test. The inspectors determined that the compromise of the 2016 operating test did not result in an actual effect on the equitable and consistent administration of the test. Because this finding was of very low safety significance (Green) and has been entered into Dominion's CAP as CR1056308, this violation is being treated as an NCV consistent with Section 2.3.2.a of the NRC Enforcement Policy. **(NCV 05000336/2016004-02, Failure to Maintain Licensed Operator Examination Integrity)**

.3 Quarterly Review of Licensed Operator Requalification Testing and Training  
(71111.11Q - 2 samples)

a. Inspection Scope

Unit 2

The inspectors observed Unit 2 control room training on June 3, which included immediate response and recovery actions for a misaligned control element assembly and a dropped control element assembly. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of alarm response and abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classifications made by the shift manager and the TS action statements entered by the unit supervisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

Unit 3

The inspectors observed Unit 3 licensed operator simulator training during an emergency preparedness drill on December 14, which included the failure of an automatic reactor trip, a steam generator tube rupture, and a faulted steam generator. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classifications made by the shift manager and the TS action statements entered by the unit supervisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 3 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structure, system, and component (SSC) performance and reliability. The inspectors reviewed system health reports, CAP documents, maintenance work orders, and maintenance rule basis documents to ensure that Dominion was identifying and properly evaluating performance problems within the scope of the maintenance rule. For each sample selected, the inspectors verified that the SSC was properly scoped into the maintenance rule in accordance with 10 CFR 50.65 and verified that the (a)(2) performance criteria established by Dominion staff was

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

#### Unit 2

- Station battery storage on December 28 (Quality Control sample)

#### Unit 3

- Auxiliary shutdown transfer switch panel on October 11
- Leading edge flow meter calorimetric indication on October 14

#### b. Findings

No findings were identified.

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

#### a. Inspection Scope

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

#### Unit 2

- High risk plan for offsite power line 348 outage on October 3
- Increased risk during 'F' instrument air compressor, 'A' reactor building closed cooling water (RBCCW) heat exchanger, and 'B' MDAFW electrical maintenance on October 5
- High risk plan emergent repair of 'B' screenwash through wall piping leakage on November 10

#### Unit 3

- Medium risk plan for station blackout diesel outage on November 2
- High risk plan for service water valve 3SWP\*MOV115A freeze seal on November 4

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 4 samples)

a. Inspection Scope

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

Unit 2

- 'A' reactor coolant pump (RCP) elevated oil leakage on November 8
- Control element drive mechanism 39 upper gripper coil amperage ripple on November 16

Unit 3

- Leading edge flow meter failure to switch to nuclear instrumentation calorimetric on October 14
- 3SWP\*MOV115A valve body dealloying on November 3

The inspectors selected these issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the operability determinations to assess whether TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TS and UFSAR to Dominion's evaluations to determine whether the components or systems were operable. 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.

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

a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed the test 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

- 'A' MDAFW pump in-service test following testing and breaker maintenance on October 5
- Charging suction isolation valve from refueling water storage tank following filter replacement and modification on October 6
- 'A' RBCCW heat exchanger following inspection and cleaning on October 7
- Online 'B' feed regulating valve packing adjustment on November 15
- 'B' EDG following preventive maintenance on December 1
- Reactor protection system trip circuit breaker multiphase amperage metering troubleshooting and replacement on December 13

## Unit 3

- 'A' MDAFW pump following preventive maintenance on October 18
- Station blackout diesel generator following maintenance outage on November 7

### b. Findings

No findings were identified.

## 1R22 Surveillance Testing (71111.22 – 1 sample)

### a. Inspection Scope

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

- Unit 3 TDAFW pump 'B' train slave relay testing on November 7

### b. Findings

No findings were identified.

## **Cornerstone: Emergency Preparedness**

### **1EP4 Emergency Action Level and Emergency Plan Changes (71114.04 – 1 sample)**

#### **a. Inspection Scope**

Dominion implemented various changes to the Millstone Emergency Action Levels (EALs), Emergency Plan, and Implementing Procedures. Dominion had determined that, in accordance with 10 CFR 50.54(q)(3), any change made to the EAL, Emergency Plan, and its lower-tier implementing procedures, had not resulted in any reduction in effectiveness of the Plan, and that the revised Plan continued to meet the standards in 50.47(b) and the requirements of 10 CFR 50, Appendix E.

The inspectors performed an in-office review of all EAL and Emergency Plan changes submitted by Dominion as required by 10 CFR 50.54(q)(5), including the changes to lower-tier emergency plan implementing procedures, to evaluate for any potential reductions in effectiveness of the Emergency Plan. 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 requirements in 10 CFR 50.54(q) were used as reference criteria.

#### **b. Findings**

No findings were identified.

### **1EP6 Drill Evaluation (71114.06 – 1 sample)**

#### **Emergency Preparedness Drill Observation**

#### **a. Inspection Scope**

The inspectors evaluated the conduct of a routine Dominion emergency preparedness drill on December 14 to identify any weaknesses and deficiencies in the classification and notification recommendation development activities. This training drill involved operators classifying events on Unit 3 related to a high RCP vibration, locked shaft on the same RCP, and followed by a steam generator tube rupture. The inspectors observed emergency response operations in the Emergency Operations Facility and the simulator control room 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

#### 2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01 – 4 samples)

##### a. Inspection Scope

The inspectors reviewed Dominion's performance in assessing and controlling radiological hazards in the workplace. The inspectors used the requirements contained in 10 CFR 20, TSs, Regulatory Guide 8.38, and the procedures required by TSs as criteria for determining compliance.

##### Inspection Planning

The inspectors reviewed the performance indicators (PI) for the occupational exposure cornerstone, radiation protection program audits, and reports of operational occurrences in occupational radiation safety since the last inspection.

##### Radiological Hazard Assessment (1 sample)

The inspectors conducted independent radiation measurements during walkdowns of the facility and reviewed the radiological survey program, air sampling and analysis, continuous air monitor use, recent plant radiation surveys for radiological work activities, and any changes to plant operations since the last inspection to verify survey adequacy of any new radiological hazards for onsite workers or members of the public.

##### Contamination and Radioactive Material Control (1 sample)

The inspectors observed the monitoring of potentially contaminated material leaving the radiologically controlled area and inspected the methods and radiation monitoring instrumentation used for control, survey, and release of that material. The inspectors selected several sealed sources from inventory records and assessed whether the sources were accounted for and were tested for loose surface contamination. The inspectors evaluated whether any recent transactions involving nationally tracked sources were reported in accordance with requirements.

##### Risk-Significant High Radiation Area (HRA) and Very High Radiation Area (VHRA) Controls (1 sample)

The inspectors reviewed the procedures and controls for HRAs, VHRAs, and radiological transient areas in the plant.

##### Problem Identification and Resolution (1 sample)

The inspectors evaluated whether problems associated with radiation monitoring and exposure control (including operating experience) 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 Safety System Functional Failures (2 samples)

a. Inspection Scope

The inspectors sampled Dominion's submittals for the Safety System Functional Failures PI for both Unit 2 and Unit 3 for the period of October 1, 2015, through September 30, 2016. To determine the accuracy of the PI data reported during those periods, inspectors used definitions and guidance contained in Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 10 CFR 50.73." The inspectors reviewed Dominion's operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, CRs, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

.2 Occupational Exposure Control Effectiveness (1 sample)

a. Inspection Scope

The inspectors reviewed Dominion submittals for the occupational radiological occurrences PI for the third quarter 2015 through the third quarter 2016. The inspectors used PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment of Performance Indicator Guidance," Revision 7, to determine the accuracy of the PI data reported. The inspectors reviewed electronic personal dosimetry accumulated dose alarms, dose reports, and dose assignments for any intakes that occurred during the time period reviewed to determine if there were potentially unrecognized PI occurrences. The inspectors conducted walkdowns of various locked HRA and VHRA entrances to determine the adequacy of the controls in place for these areas.

b. Findings

No findings were identified.

.3 Radiological Effluent TS/Offsite Dose Calculation Manual Radiological Effluent Occurrences (1 sample)

a. Inspection Scope

The inspectors reviewed Dominion submittals for the radiological effluent TS/Offsite Dose Calculation Manual radiological effluent occurrences PI for the third quarter 2015



through the third quarter 2016. The inspectors used PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment of Performance Indicator Guidance," Revision 7, to determine if the PI data was reported properly. The inspectors reviewed the public dose assessments for the PI for public radiation safety to determine if related data was accurately calculated and reported.

The inspectors reviewed the CAP database to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. The inspectors reviewed gaseous and liquid effluent summary data and the results of associated offsite dose calculations to determine if indicator results were accurately reported.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 1 semi-annual trend sample; 3 annual samples)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by IP 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 IP 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, PIs, 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 work orders to determine if Dominion is appropriately dispositioning work orders in which CR's have been closed to. This was to

review the impact of the work planning process on the stations ability to identify and correct conditions adverse to quality.

b. Findings and Observations

No findings were identified.

The inspectors performed a trend of the work week planning process by following the work for several corrective action reports through the planning process. The inspectors identified one CR (CR1014389) where a radiation monitor that failed was closed to a work order (53102702038) that adjusted the set points of the alert values. This work would not correct the identified condition adverse to quality. Upon inspector questioning, Dominion identified that the condition adverse to quality was corrected by the workers during the performance of the work order, however it was not documented in the work order. Instead, the work was documented another independent document, the list of maintenance of radiation monitoring database, IC 3408A09-001.

The inspectors identified that in the samples reviewed they were planned and completed within the planned work week. The priority codes are used in accordance with the instruction with some appropriate discretion as needed. In general, the planning process works to correct conditions adverse to quality. The supervision of the planning process is working to provide efficiency templates to better layout a standard quarter of repeatable work to allow for better integration of the various operational demands that stress the timely completion of the work during the work week.

.3 Annual Sample: Apparent Cause Evaluations (ACEs) 3020713 and 3034962 – Unit 3 Vital Inverters

a. Inspection Scope

The inspectors performed an in-depth review of Dominion's response to unplanned Unit 3 vital inverter failures on January 6 and June 29. For each failure, Dominion conducted an ACE and developed corrective actions. Dominion initially determined the January failure was due to a random electrical failure of one of the inverter diodes. Based upon a second similar failure six months later, Dominion performed another ACE and determined there was a manufacturing defect associated with the inverter diodes.

The inspectors reviewed the evaluations and the prioritization and timeliness of Dominion's corrective actions to determine whether Dominion was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of Dominion's CAP and 10 CFR 50, Appendix B.

b. Findings and Observations

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 to replace degraded diodes in Unit 3 vital inverters INV-1 and INV-2 upon receipt of information that called their reliability into question. Specifically, following two inverter failures, Dominion had not taken any corrective actions to replace degraded diodes in

the Unit 3 vital inverters from the receipt of the Exelon Power Labs report on September 20 until the susceptible diodes were inspected and replaced on November 17 and 22.

Description. The 120V vital distribution system supplies 120V power to instrumentation used by the plant. During normal operation, the four 120V vital buses (VIAC-1, VIAC-2, VIAC-3, and VIAC-4) are normally supplied from the four static inverters (INV-1, INV-2, INV-3, INV-4). Loss of normal AC input to the inverter transfers the inverter to the station battery bus and inverter failures will cause the static switch to transfer the VIAC bus to alternate AC sources. On January 6, 2016, Unit 3 INV-4 unexpectedly swapped to its alternate power source due to failed diodes. This resulted in an unplanned entry into TS LCO 3.8.3.1, Onsite Power Distribution, action b (24h shutdown action) due to 120VAC vital bus VIAC 4 not connected to Inverter 4. Dominion attributed this failure to random electrical failure, replaced the failed diodes, and exited the LCO prior to its expiration. Dominion had an additional corrective action to send the failed diodes out for lab analysis by the diode manufacturer to determine the failure modes, but did not ship the diodes until March 4, nearly two months after the initial failure. The diode manufacturer (Vishay) was unable to come up with a conclusive cause of the failure. The report noted the diodes were either shorted or had evidence of high leakage. These diodes had been installed since Dominion replaced the vital inverters with the currently installed Ametek inverters in 2007-2008 (INV-2, INV-4 in Spring 2007 refueling outage; INV-1, INV-3 in Fall 2008 refueling outage). Ametek expected the diodes to last the life of the inverter and had no recommended replacement frequency.

On June 29, 2016, Unit 3 vital inverter 3 unexpectedly swapped to its alternate power source due to failed diodes. This resulted in an unplanned entry into TS LCO 3.8.3.1, Onsite Power Distribution, action b (24h shutdown action) due to 120VAC vital bus VIAC 3 not connected to Inverter 3. Dominion replaced the failed diodes and exited the LCO prior to its expiration. This time, Dominion sent the failed diodes to Exelon Power Labs. On September 20, Exelon Power Labs issued a report that stated the failed diodes were shorted or exhibited high reverse leakage and recommended replacing inverter diodes of similar vintage. In parallel, Dominion discussed the results with Ametek, the inverter manufacturer, who stated Vishay (the diode manufacturer) had changed its manufacturing facility and processes. Previously, Vishay had used an alloy doping process to manufacture the diodes, but they found that process difficult to replicate in other manufacturing facilities and eventually switched to a diffused method of producing junctions in the diodes. The diodes installed in Unit 3 are likely from the timeframe when Vishay was experiencing quality control issues during their manufacture.

At the time of the inspection, Dominion had created a corrective action assignment, CA3036208, to inspect the diodes in INV-1 and INV-2, to see if they were from the same susceptible batch. This assignment due date was January 31, 2017, and the scheduled work dates were January 6 and 10, 2017. The inspectors questioned why a full year would pass between the first inverter failure and the completion of the extent of condition review, particularly with the evidence from Ametek that discussed potential manufacturing defects and the recommendation from Exelon Power Labs to replace the remaining diodes. Dominion rescheduled their inspections to November 17 for INV-1 and December 6 for INV-2. On November 17, Dominion determined that the diodes installed in INV-1 was susceptible to the same failure mode as INV-3 and INV-4. Once again, the inspectors questioned whether waiting an additional three weeks to inspect INV-2 was timely and commensurate with the safety significance of the issue. Dominion

rescheduled the INV-2 inspection to November 22. On November 22, Dominion discovered the diodes in INV-2 were of the same batch as the other three inverters, thus subject to the same manufacturing defects and unreliability.

In addition, the inspectors noted that INV-3 and INV-4 had their diodes replaced prior to Dominion's full understanding of the failure modes and the replacement diodes may also be from the population susceptible to the manufacturing defect. Dominion generated a corrective action assignment, CA3036209, to inspect INV-3 and INV-4 to determine if the diodes are part of the suspect batch, due January 15, 2017. The assignment states if the "date code is before 2013, initiate a work order to replace before 2021." The inspectors again questioned the timeliness of the corrective actions, specifically the wisdom of waiting potentially several years between identification of a degraded component and its replacement.

There was no warning or visible degradation over time prior to either the INV-3 or INV-4 failure that could allow for increased monitoring or other compensatory actions to restore operability. Inspection of the diodes to determine their manufacturer's information is a non-intrusive activity. Replacement of the diodes does require Dominion to remove the inverter from service, which results in a 24h TS LCO, but the actual diode replacement is a simple action.

Analysis. The inspectors found that Dominion's failure to take timely corrective action to replace degraded vital inverter diodes was a performance deficiency within Dominion's ability to foresee and correct. This performance deficiency was considered to be more than minor because it would adversely affect the Mitigating Systems cornerstone equipment performance attribute objective to ensure the availability and reliability of vital 120V power. Specifically, manufacturing defects in the diodes caused these subcomponents to fail when they were expected to last the life of the inverter. 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 although the failure challenged the reliability of the inverters it did not result in a loss of operability or functionality. This finding had a cross-cutting aspect in the Human Performance cross-cutting area associated with Work Management, in that Dominion focused on managing the risk associated with voluntarily entering a 24 hour TS LCO to replace the degraded diodes instead of the potential risk of another inverter failure. [H.5]

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 ... are promptly identified and corrected." Contrary to the above, Dominion had not taken any corrective actions to replace degraded diodes in the Unit 3 vital inverters from the receipt of the Exelon Power Labs report on September 20 until the susceptible diodes were inspected and replaced on November 17 and 22. Because this issue is of very low safety significance (Green) and Dominion has entered this issue into their CAP as CR1041301, this finding is being treated as an NCV consistent with Section 2.3.2.a of the NRC Enforcement Policy. **(NCV 05000423/2016004-03, Untimely Corrective Action for Vital Inverters)**

.4 Annual Sample: ACE 3044047- Corrosion on 3SWP\*MOV115A Valve Body

a. Inspection Scope

The inspectors performed an in-depth review of Dominion's response to emergent work to replace 3SWP\*MOV115A, the circulating pump lube water valve, which had a through wall leak of the valve body due to dealloying. On November 2, Dominion performed a semiannual inspection of the Unit 3 chlorine pit and identified corrosion on the base of the MOV115A valve body. Dominion determined this corrosion came from water leaking through MOV115A due to dealloying of the valve body material, aluminum bronze alloy C95400. In initial construction, valve MOV115A (and the corresponding 'B' train valve, 3SWP\*MOV115B) were composed of an aluminum bronze alloy not susceptible to dealloying, C95200. In 1996, Dominion replaced MOV115A with C95400 under work order 53M39611589 (MOV115B remains C95200 alloy). Upon discovery of the through wall leakage, Dominion declared the service water header inoperable, entered the applicable TS action statements, installed a blank flange in place of MOV115A under temporary modification TCC-MP-2016-023, and restored the service water header to operable prior to the expiration of the TS allowed outage time. Dominion plans to install a replacement valve made of suitable material in the next refueling outage, 3R18.

In response to the emergent work necessary to maintain system operability, Dominion performed ACE 3044047 to review potential shortfalls in engineering and work management processes and procedures. The inspectors reviewed the ACE and the prioritization and timeliness of Dominion's corrective actions to determine whether Dominion was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of Dominion's CAP and 10 CFR 50, Appendix B.

b. Findings and Observations

Dominion determined the apparent cause for the valve failure to be inadequate methods to determine where C95400 components were installed in the plant. In 2009, Dominion experienced through wall leaks of components due to dealloying, as documented in CR328821. The extent of condition review for this 2009 CR was limited to purchase order history from a specific vendor and did not cross check earlier work orders for other susceptible locations. Instead, Dominion focused the 2009 review on valves contained both in Replacement Item Evaluation PSE-MP3E-95-129 that incorrectly allowed C95400 to replace C95200 and purchase orders from 2005 to 2007 where this substitution was made. This latent engineering error propagated through later programmatic documents such as the 2012 Program for the Management of the Dealloying Aluminum Bronze Valves and Components at Millstone Station and the 2014 engineering technical evaluation, ETE-MP-2013-1210, License Renewal Review of Aging Management for Components that are Susceptible to Selective Leaching. As a result, MOV115A, replaced in 1996, was not part of this extent of condition and not subject to the same monitoring program that other susceptible valves were.

To correct this oversight, Dominion developed actions to capture any remaining valves susceptible to dealloying in a formal engineering evaluation that will receive appropriate peer and supervisory reviews.

The inspectors reviewed these actions and determined there was a licensee-identified violation associated with the failure to include MOV115A in the list of components susceptible to dealloying. The enforcement aspects of this issue are discussed in Section 4OA7.

.5 Annual Sample: Unit 2 'B' Power Operated Relief Valve (PORV) Leakage

a. Inspection Scope

The inspectors performed an in-depth review of Dominion's identification and correction of conditions adverse to quality associated with repetitive leakage of Unit 2 PORVs since modification and installation in 2006 during 2R17.

The inspectors assessed Dominion's problem identification threshold, causal analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of Dominion's corrective actions to determine whether Dominion was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of Dominion's CAP and 10 CFR 50, Appendix B and assessed the effectiveness of the implemented corrective actions.

b. Findings and Observations

No findings were identified.

In 2006, Dominion chose to upgrade the Unit 2 Pressurizer PORV and Operator Assemblies to mitigate damage associated with repetitive installation and removal to support off-site surveillance testing of the original plant equipment. The new PORVs were designed to require less maintenance and to be tested in place. During each fuel cycle since installation, either one or both of the new PORVs have leaked by their closed valve seats. This condition has resulted in Dominion isolating PORVs during each of the last four fuel cycles. On November 17, 2016, Dominion isolated the 'A' PORV due to leakage as captured in CR1054065.

The PORVs provide overpressure protection for the reactor coolant system (RCS) by relieving pressure to the quench tank thereby protecting the RCS against brittle failure. Additionally, the PORVs are sized to ensure that departure from nucleate boiling specified acceptable fuel design limits are not exceeded during analyzed events. The rated capacity per valve is one half the capacity that prevents lifting the RCS safety valves during normal plant operations and transients including a loss of load from full power. Furthermore, this capacity is sufficient to prevent lifting the safety valves in the event of a continuous control rod withdrawal from low power, in conjunction with a pressurizer pressure trip of the reactor. Blocking or isolating a PORV will prevent the valve from automatically opening on demand.

To correct PORV leakage Dominion has performed three recent ACEs with limited success. ACE 18846, from 2012, concluded that the incorrect subcomponents, mismatched valve seats and discs, were used when maintenance technicians swapped out a damaged seat during installation. Dominion also identified lost bench and post-maintenance testing opportunities in addition to training and procedural enhancements. In 2015, ACE 19950 found that Dominion failed to provide the vendor adequate testing

requirements in the purchase order for the PORVs. Dominion further identified that the welded in configuration of the current PORV design does not allow for testing prior to restoring the system. ACE 1028983, in 2016, observed that Dominion failed to take proper action upon identification of PORV leakage due to procedural weaknesses.

The Dominion CAP procedure, PI-AA-200, provides instructions to station management to ensure selection of the most appropriate causal analysis tools during CR screening. Consistent with previous screening, CR1054065 was screened as Significance Level 2, Potentially Significant Condition. These conditions are identified as precursors to significant events. PI-AA-200, Attachment 6, "CAQ Screening Matrix," recommends consideration of a root cause evaluation (RCE) for potentially significant repetitive conditions. The inspectors observed that Dominion initially elected to perform another ACE for isolation of the 'A' PORV captured in CR1054065. However, consistent with a healthy corrective action program, station staff assigned analysis of the issue identified that the three recent ACEs had not successfully prevented PORV leakage and requested elevation to a RCE to ensure the appropriate rigor. Dominion has scheduled completion of the associated RCE (CA3048134) for February 12, 2017.

#### 4OA3 Follow-up of Events and Notices of Enforcement Discretion (71153 – 1 sample)

(Closed) LER 05000336/2015-001-00: Historical Oil Leakage from 'C' RBCCW Pump Bearings Challenged Meeting Mission Time

On April 17, 2015, NRC inspectors questioned the historic operability of the Millstone Unit 2 'C' RBCCW pump because several CRs had reported the need to frequently add oil to the pump's outboard bearing bubbler between November 2014 and early April 2015. Upon further review, Dominion concluded that operability could not be assured since there may not have been sufficient oil to meet mission time requirements at all times with no compensatory measures in place. Millstone Unit 2 TS 3.7.3.1, "Reactor Building Closed Cooling Water System," requires that two RBCCW loops shall be operable. Since there were periods of time that plant operators were crediting the 'C' RBCCW pump for one of the two required RBCCW loops, and operability could not be assured at all times, Dominion reported this event pursuant to 10 CFR 50.73(a)(2)(i)(B), as a condition that was prohibited by Unit 2 TSs.

Dominion's extent-of-condition review identified an additional period, from July 2013 through December 2013, when 'C' RBCCW pump's inboard bearing oil leakage challenged the pump's mission time. Based on additional review, operations determined that two other RBCCW pumps (the 'A' and 'B' pumps) were available at all times to meet the TS requirements when oil leaks challenged the 'C' RBCCW pump's mission time, except during a 118 hour period between September 22, 2013, and September 26, 2013, when only one RBCCW loop was available to perform the required safety functions of the RBCCW system because the 'B' RBCCW pump was removed from service for planned maintenance. During this time, the 'A' RBCCW pump remained available to meet the RBCCW system safety functions. In May 2015, the inspectors identified two findings of very low safety significance associated with this event that were dispositioned in NRC Component Design Bases Inspection Report 05000336/2015007 and 05000423/20015007, Section 1R21.2.1.5 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15166A344). The inspectors noted that the Region I senior reactor analyst's detailed risk evaluation for the above findings enveloped the additional exposure time identified during Dominion's extent-of-condition

review. The inspectors did not identify any new issues during the review of the LER. (See Section 4OA5.3 for additional details associated with inspector follow-up for the 2015 RBCCW Severity Level (SL) IV NCV). This LER is closed.

#### 4OA5 Other Activities

##### .1 IP 92702, "Follow-up on Traditional Enforcement Actions Including Violations, Deviations, Confirmatory Action Letters, Confirmatory Orders, and Alternate Dispute Resolution Confirmatory Orders"

###### a. Inspection Scope

During the weeks of October 31, 2016, and November 14, 2016, the inspectors performed an onsite review of Dominion's records related to corrective actions taken in response to a Confirmatory Order issued to Dominion on August 26, 2015 (ADAMS Accession No. ML15236A207). The associated apparent violations are described in an NRC letter to Dominion, dated April 29, 2015, and is publically available (ADAMS Accession No. ML15119A028). The violations involved (1) Dominion's changes to the Millstone Unit 2 UFSAR that removed credit for charging pump flow in the mitigation of the design basis accident involving the inadvertent opening of pressurizer PORVs, without obtaining prior NRC approval; (2) Dominion's failure to provide complete and accurate information to the NRC in reports and other documents pertaining to the aforementioned UFSAR change; and (3) Dominion's changes made to the Millstone Unit 2 UFSAR and TS Bases that decreased the required amount of irradiated fuel decay time from 150 to 100 hours prior to fuel movement in the reactor vessel, without obtaining prior NRC approval. The objectives of the inspection were to ensure that Dominion implemented adequate and timely corrective actions as specified in the Confirmatory Order. The inspectors compared the actions taken to the requirements of Dominion's procedures, Dominion's CAP, and 10 CFR 50, Appendix B. The inspectors reviewed associated corrective action CRs, revised procedures, and relevant references. The inspectors also interviewed management and staff personnel who participated in the evaluation and implementation of the Confirmatory Order action items. The inspection criteria used included the inspection guidance contained in NRC IP 92702 and the performance attributes listed in Table 1 of IP 71152, "Problem Identification and Resolution."

###### b. Findings and Observations

No findings were identified.

Confirmatory Order action item 8 required Dominion, by no later than June 30, 2016, to complete a self-assessment of its 10 CFR 50.59 program and procedures (including applicability, screening, and evaluations) including a review of procedures, implementation, initial training, continuing training, and safety review committee activities. The Confirmatory Order stipulated that the majority of the self-assessment team be comprised of a combination of non-Dominion industry experts and peers. In addition, the Confirmatory Order required the assessment to address the Millstone Nuclear Oversight organization's responsibilities and the effectiveness of the execution of those responsibilities regarding the 50.59 program.



The 50.59 self-assessment team performed the assessment during the week of February 15, 2016, and completed the associated report (PIR No. 1020010) on April 14, 2016. The inspectors noted that the majority of the self-assessment team (five of eight team members) were non-Dominion industry experts and peers. The self-assessment team determined that Dominion effectively implemented the 50.59 program at Millstone. However, the self-assessment team recommended a number of changes to improve the program and product quality and identified several organizational learning opportunities (enhancements). The inspectors noted that Dominion's self-assessment objectives aligned with the Alternate Dispute Resolution (ADR) Order action item requirement and that Dominion developed a detailed scope to assess each objective. The inspectors concluded that the self-assessment was appropriately focused, critical, thorough, and effective in identifying issues. The inspectors also noted that Dominion effectively used the CAP to identify, evaluate, and track the associated performance deficiencies and enhancements through resolution. Based on satisfactory completion, the inspectors closed Confirmatory Order action item 8.

Confirmatory Order action item 9 required Dominion to make available for NRC review the results of two ACEs addressing the issues included in the Confirmatory Order. The two associated ACEs were ACE 19921, "Changes to U2 FSAR Section 14.6.1 and Failure to Provide Complete and Accurate Information to NRC," and ACE 19923, "Failure to Obtain Approved License Amendment Prior to FSAR Change for Irradiated Fuel Decay Time." For ACE 19921, Dominion concluded that the apparent cause was inadequate verification of technical basis information contained in documents supporting regulatory submittals dated 2002 through 2007. In addition, Dominion identified two contributing causes: (1) that awareness of 50.9(b) reporting requirements and guidance for evaluating 10 CFR 50.9(b) reportability were insufficient to support compliance, and (2) regulatory risk considerations, including external input, were not clearly appreciated and understood. For ACE 19923, Dominion concluded that the apparent cause was less than adequate rigor and challenge to a plan that resulted in not meeting regulatory requirements, even when prompted by the licensing and 50.59 screening process. The inspectors determined that Dominion's associated evaluations were sufficiently thorough, methodical, and based on the best available information, interviews, and relevant operating experience. Dominion's assigned corrective actions were aligned with the identified causal factors, adequately tracked, appropriately documented, and completed as scheduled. Based on satisfactory completion, the inspectors closed Confirmatory Order action item 9.

Confirmatory Order action item 10 required Dominion, by no later than March 1, 2016, to complete a common cause evaluation of 10 CFR 50.59 issues identified after July 1, 2012, with emphasis on any underlying culture-related issues that specifically may have existed in the Millstone engineering and licensing groups and the Facility Safety Review Committee (FSRC). The Confirmatory Order stipulated that the team include a member trained in cultural issues, that interviews of a sample of the staff members from the above groups be included in the evaluation, and that Dominion communicate the results of the evaluation to Millstone employees within three months of receiving the evaluation results. In response, in December 2015, a team composed of Fleet and Millstone personnel with one external peer conducted a common cause analysis ((CCA) 3009063) of 10 CFR 50.59 issues identified since July 2012. The team included one member trained on and experienced with cultural issues. The Millstone Station Corrective Action Review Board (CARB) reviewed and approved the CCA results on February 8, 2016. The Millstone Station Safety and Licensing Director communicated the CCA results to

Millstone employees on March 30, 2016. The CCA team identified the following common cause: engineering, nuclear licensing, and FSRC leadership were intermittently engaged with the 10 CFR 50.59 process during the trend period evaluated. The CCA team noted that leadership engagement improved after NRC inspectors identified issues early in the trend period; however, leadership did not sustain this improvement throughout the remainder of the trend period. The CCA team cited several examples where leadership engagement was lacking including insufficient monitoring of 10 CFR 50.59 products, insufficient response to adverse trends, and insufficient planning to ensure that an acceptable level of performance was sustained. The CCA team noted that the intermittent engagement manifested itself in several cultural areas, most notably weaknesses in personal accountability, continuous learning, and leadership behaviors. The CCA team observed that this was consistent with other important RCEs and ACEs conducted by the station during the trend period. During interviews with CCA team members, Dominion personnel stated that recent training initiatives were effective in improving personal accountability to the 10 CFR 50.59 process. The CCA team noted that recent performance had improved and reflected the increased emphasis that management had placed on the issue.

The CCA team identified that many corrective actions were initiated and/or in progress addressing the areas of personal accountability, continuous learning, and leadership. The CCA team did not repeat these actions as many were ongoing or pending an effectiveness review, however, did consider them in their overall analysis of the trend period. For example, the CCA team noted the following Dominion ongoing actions: (1) revising the 10 CFR 50.59 continuing training plan (RCE 01123), (2) actions to improve engineering training review board performance (ACE 19903), and (3) Millstone Excellence Plan actions to improve leadership alignment and engineering accountability. In addition to these ongoing actions, the CCA team developed actions to improve long-term sustainability to guard against future leadership changes that may reduce oversight of 10 CFR 50.59 products and the underlying behaviors and designated the initiatives as corrective actions to prevent recurrence (CAPRs). These CAPRs included: (1) revising applicable Fleet procedures to require the designation of a 10 CFR 50.59 station process owner and subject matter expert, (2) revising applicable Fleet procedures to formalize feedback from the engineering Quality Review Team, (3) revising applicable Fleet procedures to formalize feedback from the FSRC, and (4) revising applicable Fleet procedures to require a review of 10 CFR 50.59 trends at Station Management Review meetings. The inspectors noted that Dominion's common cause evaluation charter and associated in-depth analysis was aligned with the ADR Order action item requirement. The inspectors concluded that Dominion's evaluation was appropriately focused, critical, thorough, and effective in identifying common causes. The inspectors also noted that Dominion effectively used the CAP to identify, evaluate, and track the associated common cause related issues through resolution. Based on satisfactory completion, the inspectors closed Confirmatory Order action item 10.

Confirmatory Order action item 11 required Dominion, by June 30, 2016, to complete a formal sampling program, using MIL Standard 105 or similar, of products (applicability determinations, screenings, and evaluations) completed using Dominion's 10 CFR 50.59 programs and procedures. Specifically, the Confirmatory Order stipulated third party independent reviewers; sampling applicability determinations, screenings, and evaluations as separate populations; and a sampling time period from 2002 through the date of the Confirmatory Order (August 26, 2015) for each population. In December 2015, Dominion contracted with Preferred Licensing Services (PLS) to perform a third

party independent formal sampling program of 10 CFR 50.59 products completed using Dominion's 10 CFR 50.59 programs and procedures during the period January 1, 2002, through August 26, 2015. PLS conducted the third party independent formal sampling during the period January 5, 2016, through June 3, 2016. PLS used a random sampling process per MIL-STD-105E that resulted in the selection of 16 evaluations, 203 screens, and 320 applicability reviews (determinations) for detailed third party independent review. The PLS team actually included a few additional documents in their sample to ensure that the sample size exceeded the minimum sample size specified by MIL-STD-105E.

Based on a resume review, the inspectors noted that each of the seven members of the formal sampling team was independent of Dominion and experienced in the 10 CFR 50.59 process. The inspectors noted that the PLS team's independent 10 CFR 50.59 reviews were methodical, very critical, second checked, and well documented. In addition, the inspectors noted that Dominion personnel implemented corrective actions associated with the identified issues commensurate with their safety significance using the Dominion CAP. The inspectors reviewed all the PLS review forms (10 CFR 50.59 independent review documentation) for each of the evaluations and screens, and the majority of PLS review forms for the applicability reviews. The inspectors also independently reviewed nine screens and three applicability reviews that the PLS sampling team reviewed. The team compared the screens and applicability reviews, including supporting documents, to the guidance and methods provided in NEI 96-07, "Guidelines for 10 CFR 50.59 Evaluations," to determine the adequacy of these 50.59 products. In addition, the NRC Modification and 50.59 Team independently reviewed four of the 50.59 evaluations that the PLS sampling team reviewed (see NRC Evaluation of Changes, Tests, or Experiments and Permanent Modifications Team Inspection Report 05000336/2016007 and 05000423/2016007) with no resultant findings of significance. Based on satisfactory completion, the inspectors closed Confirmatory Order action item 11.

Confirmatory Order action item 13 required Dominion, by December 31, 2016, to provide a presentation at an industry forum to discuss the events that led to the Confirmatory Order, the lessons learned, and actions taken. Dominion senior management made a 10 CFR 50.59 presentation at the Institute of Nuclear Power Operations (INPO) Engineering Vice Presidents meeting on October 12, 2016. The inspectors reviewed the presentation slides and talking points. The inspectors noted that Dominion's presentation fully satisfied the ADR Order action item requirement. Based on satisfactory completion, the inspectors closed Confirmatory Order action item 13.

Confirmatory Order action item 14 required Dominion to review its plant access training (PAT) and revise it as necessary to ensure that it included training on compliance with NRC requirements, including, but not limited to, 10 CFR 50.5 and 50.9. On November 3, 2015, Dominion documented completion of their PAT review in response to Confirmatory Order action item 14 (CA3009058). Dominion determined that there was sufficient training on compliance with 50.5 and 50.9 prior to issuance of the Order. However, the reviewer recommended explicitly referencing 50.5 in the discussion of willful misconduct as a beneficial enhancement. The training staff agreed with the reviewer's recommendation and modified the applicable PAT slide accordingly. The inspectors reviewed the applicable PAT slides, and determined that the training material covered compliance with NRC requirements, including 10 CFR 50.5 and 50.9, in sufficient detail.

Based on satisfactory completion, the inspectors closed Confirmatory Order action item 14.

Confirmatory Order action item 15 required Dominion to develop and provide focused training to Dominion corporate engineering and licensing personnel who perform work for Millstone and to Millstone Station engineering and licensing personnel, to ensure awareness of the importance of complying with regulatory requirements, and the potential consequences of a failure to comply, including what constitutes a willful violation of NRC requirements. The Confirmatory Order stipulated that Dominion provide this training by April 1, 2016, and repeat it 12 months after the initial training session. Similarly, Confirmatory Order action item 16 required Dominion to develop and provide focused training to Dominion corporate engineering and licensing personnel performing work for Millstone and to Millstone Station engineering and licensing personnel, covering the requirements of 10 CFR 50.9, emphasizing the importance of providing complete and accurate information to the NRC, and of informing the NRC promptly upon discovery of inaccurate information or omissions associated with pending NRC licensing actions or other information submitted to the NRC. The Confirmatory Order stipulated that Dominion provide this training by April 1, 2016.

Dominion licensing developed and recorded a 90 minute regulatory sensitivity and awareness training video titled "Understanding the NRC/Licensee Interface" to comply with Confirmatory Order action items 15 and 16. Based on recorded training documentation, Dominion licensing presented this training video to Dominion corporate engineering and licensing personnel who perform work for Millstone and to Millstone Station engineering and licensing personnel during the period October 13, 2015, through March 7, 2016. In addition, Dominion licensing created a training assignment, via their Learning Management System, for all applicable Dominion corporate and Millstone Station personnel to repeat this regulatory sensitivity and awareness training after February 19, 2017, with a completion date of March 31, 2017, for Millstone Station personnel (prior to the Millstone 2R24 outage) and prior to April 14, 2017, for Dominion corporate personnel. Based on interviews, the inspectors noted that Dominion personnel commented positively on the training and retained adequate knowledge of the subject matter. The inspectors viewed the 90 minute regulatory sensitivity and awareness training video and noted that the training video was of high quality, was appropriately focused, and fully satisfied the ADR Order action item requirements. Based on satisfactory completion, the inspectors closed Confirmatory Order action items 15 and 16.

.2 IP 92702, "Follow-up on Traditional Enforcement Actions Including Violations, Deviations, Confirmatory Action Letters, Confirmatory Orders, and Alternate Dispute Resolution Confirmatory Orders"

a. Inspection Scope

During the weeks of October 31, 2016, and November 14, 2016, the inspectors performed an onsite review of Dominion's records related to corrective actions taken in response to an SL III Notice of Violation (NOV), issued to Dominion on February 10, 2015 (ADAMS Accession No. ML15041A162). The NOV was associated with Dominion's failure to complete a 10 CFR 50.59 evaluation for removing the Millstone severe line outage detection (SLOD) special protection system (SPS). The NOV is described in NRC Special Inspection Report 05000336 and 05000423/2014011 and is

publically available (ADAMS Accession No. ML14240A006). The objectives of the inspection were to ensure that Dominion implemented adequate corrective actions for the SL III NOV, identified root causes, addressed generic implications, and appropriately enhanced Dominion's programs and practices to prevent recurrence. The inspectors compared the actions taken to the requirements of Dominion's procedures, Dominion's CAP, and 10 CFR 50, Appendix B. The inspectors reviewed corrective action CRs, revised procedures, and relevant references. The inspectors also interviewed management and staff personnel who participated in the evaluation and implementation of corrective actions for the violation. The inspection criteria used included the inspection guidance contained in IP 92702 and the performance attributes listed in Table 1 of IP 71152.

b. Findings and Observations

No findings were identified.

On June 5, 2014, Dominion approved Standing Order SO-14-018, Revision 0. Subsequently, on June 6, 2014, Dominion approved Standing Order SO-14-018, Revision 1, and an associated operability determination (OD000591) that required verification (once per shift) of all 345KV lines in service at the Millstone switchyard via a temporary log. Dominion maintained this compensatory measure in place (tracked via CA285983 and CA3032572, and periodic corrective action reviews) until the NRC approved the associated license amendment for both Millstone units. Dominion's response to the SL III NOV associated with the failure to complete a 10 CFR 50.59 evaluation for removing the Millstone SLOD SPS was submitted to the NRC on March 31, 2015, under Dominion Letter Serial No. 15-073, and is publically available (ADAMS Accession No. ML15097A084). By letter dated June 30, 2015, Dominion requested an amendment for Millstone Units 2 and 3 to remove the Millstone SLOD SPS (ADAMS Accession No. ML15183A022). On July 28, 2016, the NRC issued Amendment No. 328 for Millstone Unit 2 and Amendment No. 269 for Millstone Unit 3 to revise the respective Final Safety Analysis Report (FSAR) to: (1) delete the information pertaining to the SLOD SPS, (2) update the description of the tower structures associated with the four offsite transmission lines feeding Millstone Station, and (3) describe how the current offsite power source configuration and design satisfies the requirements of GDC-17, "Electric Power Systems," and GDC-5, "Sharing of Structures, Systems, and Components." In addition, the amendments also approved a new Technical Requirements Manual requirement, "Offsite Line Power Sources," for both Millstone units.

On July 15, 2014, following the NRC Special Inspection Team exit, Dominion initiated corrective action CR553967 for the Apparent SL III NOV. Dominion effectively used CR553967 and their CAP to identify and track corrective actions including the RCE, CAPRs, operating experience notifications, and effectiveness reviews. On September 4, 2014, Dominion completed RCE 001123, "NRC LOOP SIT Exit Includes Apparent Violation Severity Level III Millstone Unit 2/3 Root Cause Evaluation," Revision 1. Dominion determined that the root cause was that engineering leadership did not ensure adequate continuing training content development to maintain proficiency for performing 50.59 screens. As a result, the continuing training for 50.59 screens was not adequate to maintain the proficiency and skills necessary for consistent, accurate 50.59 screens. Dominion's corrective actions included revising Millstone's 50.59 continuing training plan to consider the objectives, setting, and evaluation method for the training to ensure

alignment with the difficulty, importance, and frequency of performing 50.59 tasks. Dominion's corrective actions also included developing and implementing the required training and follow on effectiveness reviews of the new training. Dominion also identified two contributing causes: (1) engineering leadership failed to recognize the magnitude and impact of the continuing issue with 50.59 performance and address the ongoing threat, and (2) engineering leadership failed to effectively use performance improvement tools to identify emerging performance issues. In response, the Engineering Director and Organizational Effectiveness Manager, respectively, took timely and appropriate actions to address these contributing causes, including documenting their actions in the CAP (CACC001120 and CACC001121).

On April 22, 2015, to address the extent-of-condition, design engineering completed a review of license basis documentation and FSAR change requests initiated over the previous three years to verify that 50.59 screens and evaluations addressed licensing basis impacts (CACC001122). Design engineering reviewed the associated 50.59 applicability reviews, screens, and evaluations for all change requests initiated in 2011 through 2014 to ensure that they covered the 3-year look back assignment. Design engineering identified deficient screens related to the Unit 2 and Unit 3 SLOD-related modification and a questionable screen related to a Unit 2 spent fuel pool purification system change. Engineering initiated CR575063 to evaluate and address corrective actions as needed. Engineering determined that all other 50.59 applicability reviews, screens, and evaluations adequately addressed licensing basis impacts. As part of the ADR Confirmatory Order follow-up, the inspectors independently reviewed numerous Dominion 50.59 products (past and current) and PLS Third Party 50.59 review forms to assess Dominion's compliance with 50.59 requirements (see Section 4OA5.1 above). In addition, the inspectors independently reviewed all TS Bases change requests (not associated with an NRC approved Amendment) for Millstone Units 2 and 3 since January 1, 2009, to verify that the associated 50.59 screens and evaluations adequately addressed licensing basis impacts, including TS requirements.

The inspectors noted that Dominion's root cause and corrective actions were consistent and aligned with Dominion's SL III NOV response letter submitted to the NRC on March 31, 2015. The inspectors determined that Dominion's associated evaluations were sufficiently thorough and based on the best available information, sound judgment, and relevant operating experience. Dominion's assigned corrective actions were aligned with the identified causal factors, adequately tracked, appropriately documented, and completed as scheduled. Based on interviews with Dominion 50.59 evaluators and screeners, review of Dominion's associated effectiveness reviews, and independent review of recent 50.59 products (see also Section 4OA5.1 above), the inspectors concluded that Dominion took appropriate corrective actions for the identified 50.59 performance deficiencies. Based on satisfactory completion of the above corrective actions, the inspectors closed this SL III NOV.

.3 IP 92702, "Follow-up on Traditional Enforcement Actions Including Violations, Deviations, Confirmatory Action Letters, Confirmatory Orders, and Alternate Dispute Resolution Confirmatory Orders"

a. Inspection Scope

During the weeks of October 31, 2016, and November 14, 2016, the inspectors performed an onsite review of Dominion's records related to corrective actions taken in

response to a SL IV NCV (NCV 05000336 and 05000423/2015-007-02), issued to Dominion on June 12, 2015. The NCV was for Dominion's failure to perform a 10 CFR 50.59 evaluation associated with a Unit 2 RBCCW pump operator compensatory action. The NCV is described in NRC Inspection Report 05000336/2015007 and 05000423/2015007 and is publically available (ADAMS Accession No. ML15166A344). The objectives of the inspection were to ensure that Dominion implemented adequate corrective actions for the SL IV NCV, identified apparent causes, addressed generic implications, and appropriately enhanced Dominion's programs and practices to prevent recurrence. The inspectors compared the actions taken to the requirements of Dominion's operating and administrative procedures; Dominion's CAP; 10 CFR 50, Appendix B; Dominion's TSs; and the Maintenance Rule. The inspectors reviewed corrective action CRs, procedures, and relevant references. The inspectors also interviewed management and staff personnel who participated in the evaluation and implementation of corrective actions for the violation. In addition, the inspectors performed walkdowns of several safety-related pumps at Unit 2 and Unit 3 (including the Unit 2 RBCCW pumps) to independently assess the bearing oil level indications, material condition, and configuration control. The inspection criteria used included the inspection guidance contained in IP 92702 and the performance attributes listed in Table 1 of IP 71152.

b. Findings and Observations

No findings were identified.

On April 27, 2015, Dominion initiated CR577964 to evaluate the associated condition adverse to quality within their CAP. On May 5, 2015, Dominion implemented Standing Order, SO-15-010, reinforcing 10 CFR 50.59 regulatory requirements to plant operators (CA302115). On May 19, 2015, Dominion implemented OP-AA-102, "Operability Determination," Revision 13, to require operators to declare the component inoperable due to a degraded or non-conforming condition (oil leakage) if mission time is not met without operator action (CA301920). On May 1, 2015, following the NRC Component Design Bases Inspection Team exit, Dominion initiated corrective action CR578418 for the SL IV NCV and for a related Unit 2 RBCCW pump TS violation. Dominion used CR 578418 and their CAP to identify and track corrective actions including the associated ACEs, CAPRs, reportability determinations (see Section 4OA3.1), and effectiveness reviews. On June 12, 2015, the Millstone Station CARB approved ACE 019925, "CDBI Exit, Potential Traditional Enforcement Level IV Finding Apparent Cause Evaluation," Revision 0. Dominion determined that the apparent cause was that developers of the procedural guidance found in OP-AA-102, "Operability Determination," Revision 12, Attachment 1, Step 7.c did not consider adding oil to a safety-related pump during mission time as 'temporary use of operator action in place of automatic action' as defined in NRC guidance documents.

Dominion personnel credited Revision 13 to OP-AA-102 (completed in May 2015 in response to CR577964 as noted above) as one of the corrective actions addressing the apparent cause (AC-1, CA- 1). Dominion also identified, tracked, and completed additional corrective actions including addressing additional operability determination procedure inconsistencies in the use of compensatory measures to restore operability (CA305071), removing guidance from engineering technical support procedures that directed no evaluation required for maintaining pumps during mission time by replenishment (CA305072), and performing a gap analysis of Dominion's operability

determination procedure (OP-AA-102) as compared to NRC regulatory guidance contained in IMC 0326, "Operability Determinations & Functionality Assessments for Conditions Adverse to Quality or Safety" (CA305075). Subsequently on February 10, 2016, Dominion implemented OP-AA-102, Revision 14, to provide additional operability guidance to operators for components with a potentially degraded or non-conforming condition due to oil leakage that challenges mission time without operator action. The additional operability guidance for operator actions associated with replenishment included documenting the action as a compensatory measure in a prompt operability determination (OP-AA-102, Attachment 5). The inspectors also noted that OP-AA-102, Attachment 5, required a 10 CFR 50.59 review for compensatory measures.

As noted above, Dominion also used CR578418 and their CAP to identify and track corrective actions for a related Unit 2 RBCCW pump TS violation associated with oil leakage trending and RBCCW pump operability. As the performance deficiency associated with the RBCCW pump TS violation was closely related to the SL IV NCV, the inspectors also reviewed ACE 019918, "Violation of Technical Specification 3.7.3.1 'C' RBCCW Apparent Cause Evaluation," and Dominions associated corrective actions. Dominion determined that the apparent cause was that shift personnel were not required or supported by a process to identify excessive oil leak rates affecting equipment operability. In particular, operators relied on visual cues to determine whether the oil leak was acceptable. Also, information was not readily available to determine leak rates. Operators did not correlate oil leakage rates to the mission time which led to several instances where unacceptable leak rates were not identified as potential operability concerns. Dominion identified, tracked, and completed corrective actions including changing the Unit 2 and Unit 3 lubrication program procedures (CA305082 and CA305083) and implementing additional training for shift managers and shift technical advisors to address potential gaps in understanding and applying the regulatory requirements pertaining to operability determinations and compensatory measures (CA305482).

However, the inspectors identified that Dominion did not adequately implement corrective action No. 1 (AC-01, CA-01) for this apparent cause. Specifically, CA305085 (which implemented AC-01, CA-01) stated "Revise OP-AA-102, Attachment 1, Step 7.c, which covers oil and coolant leaks, to read: If mission time is not met, then declare component inoperable due to a degraded or nonconforming condition. When there is a question about oil leakage, this step will require calculating the leak rate when adding oil, which has been lost due to leakage, whether it is normal shaft leakage or abnormal leakage. This action can be measured by monitoring CRs for oil additions/leaks and by verifying that the conditions do not challenge mission time or by verifying that the leak rate is calculated and compared to the maximum leak rate allowed to meet mission time." Dominion personnel closed CA305085 to Revision 13 to OP-AA-102 (completed in May 2015 in response to CR577964 as noted above); however, contrary to the corrective action assignment, Revision 13 only included the first sentence and failed to include the additional guidance pertaining to oil leakage monitoring, measuring, trending, and mission times. The inspectors also noted that Dominion missed an opportunity to identify this deficiency when completing an effectiveness for this ACE in February 2016. The inspectors independently screened this issue in accordance with IMC 0612, Appendix B, "Issue Screening," and IMC 0612, Appendix E, "Examples of Minor Issues," and determined that this issue was minor. Specifically, inspectors reviewed a risk-informed sample of oil leakage CRs initiated since June 2015 and noted that in general, Dominion personnel adequately performed oil leakage trending and operability screens.



In addition, the inspectors noted that Revision 14 to OP-AA-102 (implemented in February 2016 in response to CA305071 as noted above) provided additional oil leakage operability guidance. Dominion documented this issue in their CAP as CR1054036.

Based on system health report and CAP reviews, plant walkdowns, and interviews with site personnel, the inspectors concluded that Dominion identified oil leakage issues and entered them into the CAP at a low threshold. In general, inspectors did not identify any issues or concerns that had not been appropriately entered into the CAP for evaluation and resolution. The inspectors determined that Dominion's associated ACEs were sufficiently thorough and based on the best available information, sound judgment, and relevant operating experience. In general, Dominion's assigned corrective actions were aligned with the identified causal factors, adequately tracked, appropriately documented, and completed as scheduled. Based on plant walkdowns, corrective action CR reviews (including oil leakage trending), review of Dominion's associated effectiveness reviews, and independent review of recent operability determination and 50.59 products (see also Section 4OA5.1 above), the inspectors concluded that Dominion took appropriate corrective actions for the identified 50.59 performance deficiency. Based on satisfactory completion of the above corrective actions, the follow-up inspection associated with this NCV is complete.

#### .4 INPO Report Review

##### a. Inspection Scope

The inspectors reviewed the report for the INPO plant assessment of Millstone dated October 2016. The inspectors evaluated this report to ensure that NRC perspectives of Dominion performance were consistent with any issues identified during the assessments. The inspectors also reviewed these reports to determine whether INPO identified any significant safety issues that required further NRC follow-up.

##### b. Findings

No findings were identified.

#### 4OA6 Meetings, Including Exit

On January 25, 2017, 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.

#### 4OA7 Licensee-Identified Violations

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

- 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action", states in part that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. Contrary to this, Dominion failed to identify 3SWP\*MOV115A, the circulating water pump lube water valve, was part of a

population of valves subject to dealloying and did not take appropriate corrective actions prior to valve failure. Dominion discovered this issue during a planned system walkdown and entered it into the CAP as CR1052697. The inspectors evaluated this finding using IMC 0609.04, "Initial Characterization of Findings," and IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," and determined that the finding was of very low safety significance (Green) because the finding did not represent a loss of system or function, or an actual loss of a train for greater than its TS allowed outage time, or an actual loss of function of one or more non-TS trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for greater than 24 hours.

**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  
D. Brown, Supervisor, Nuclear Training  
J. Burkirk, Outage Control Center Health Physics Representative  
J. Chappell, Radiation Protection Technician  
F. Cietek, Risk Analyst  
T. Cleary, Licensing  
G. Cochran, Supervisor, Nuclear Site Safety  
M. Cote, Supervisor, Nuclear Training  
L. Crone, Chemistry Manager  
B. Dawson, Mechanical Analysis Engineer  
C. DeBiasi, Chemistry Technician  
S. Doboe, Unit 2 Shift Manager  
D. DelCore, Shift Supervisor, Health Physics  
D. Dodson, Manager of Programs  
D. Dougherty, Unit 2 RBCCW System Engineer  
T. Dubay, System Engineer  
M. Dunivan, Supervisor, Health Physics Auxiliary Building  
P. Fitzgerald, Exam Developer  
K. Gannon, Supervisor, Health Physics  
M. Garza, Unit 2 Senior Nuclear Shift Operator  
J. Glaub, Chemistry Technician  
T. Gleason, Radiation Protection Technician  
W. Gorman, RMS Supervisor  
M. Goolsby, Unit 2 Operations Manager  
B. Graber, Supervisor, Radiological Analysis  
M. Hall, Dominion Corporate Welding Engineer  
K. Hacker, Dominion Corporate Level III  
D. Jacobs, Exam Developer  
C. Janus, Maintenance Rule Program Owner  
A. Johnson, Health Physics  
J. Langan, Manager, Nuclear Oversight  
L. Lebaron, System Engineer  
M. Marino, Supervisor, Mechanical Engineering Analysis  
R. McGuinness, Mechanical Design Engineer (50.59 Subject Matter Expert)  
G. Modzelewski, CFAM – Design Engineering  
T. Morris, Secondary Chemist  
J. Nelson, Health Physicist  
T. Olsowy, Licensing  
R. Parrette, Operations  
A. Passwater, Sampling Program Team Lead, Preferred Licensing Services (PLS)  
M. Roche, Health Physicist III

B. Ross, Radiation Protection Supervisor Unit 3  
 D. Rowe, Unit 3 Operations  
 D. Smith, Site Emergency Preparedness Manager  
 J. Stafford, Director, Nuclear Training  
 A. Vargas, Licensing  
 C. Walsh, Superintendent, Nuclear Operations Training  
 B. Wilkens, EP Specialist

Others:

J. Semancik, Director, Radiation Division, Connecticut Department of Energy and Environmental Protection

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

Discussed

EA-13-188	ADR	Alternate Dispute Resolution Confirmatory Order dated August 26, 2015 (Section 4OA5.1)
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Opened and Closed

05000336 & 423/2016001-01	NCV	Routine Failure to Perform Engineering Evaluation of Long Term Scaffolding (Section 1R05)
05000336/2016004-02	NCV	Failure to Maintain Licensed Operator Examination Integrity (Section 1R11)
05000423/2016004-03	NCV	Untimely Corrective Action for Vital Inverters (Section 4OA2)

Closed

05000336 & 423/2014-011-01	VIO	Failure to Complete a 10 CFR 50.59 (Section 4OA5.2)
05000336/2015-001-00	LER	Historical Oil Leakage from "C" RBCCW Pump Bearings Challenged Meeting Mission Time (Section 4OA3.1)

**LIST OF DOCUMENTS REVIEWED**

**Section 1R01: Adverse Weather Protection**

Procedures

OP 3353.SBO, Station Blackout Diesel Annunciator Response, Revision 8  
 C OP 200.13-003, Unit 3 Cold Weather Preparation Checklist, Revision 001-01  
 C OP 200.13, Seasonal Weather Operations, Revision 004-04

C OP 200.13-002, Unit 2 Cold Weather Preparation Checklist, Revision 002-02  
Unit 3 Daily Night Orders

Condition Reports

531160	533611	1024216	1024318
1026302	1031835	1042637	1042667
1045212	1045503	1047900	1048776
1049905	1052768	1053782	

Drawings

25212-26958 Sheet 3, Station Blackout Diesel Fuel Oil System, Revision 10

Work Orders

53102918147	53103000879	53103012205	53102945968
53102677985	53102683962	53102999130	53102921781
53102945657			

**Section 1R04: Equipment Alignment**

Procedures

OP 3322, Auxiliary Feedwater System, Revision 026  
OP 2346A-015, "A" DG Breaker/Control Switch Alignment, Revision 000  
OP 2346A-014, "A" DG Lube Oil Valve Alignment, Revision 000-02  
OP 2346A-012, "A" DG Starting Air Valve Alignment, Revision 000  
OP 2346A-011, "A" DG Service Water Valve Alignment, Revision 001  
OP 2346A-013, "A" DG Jacket Water Valve Alignment, Revision 000-02  
OP 2346A, "A" Emergency Diesel Generator, Revision 030  
SP 3630E.2, Safety Injection Pump B Cooling Pump Operational Readiness Test, Revision 008  
SP 3608.2, Safety Injection Pump B Operational Readiness Test, Revision 010-04  
SP 3608.2-001, Safety Injection Pump B Quarterly IST Pump Test, Revision 010  
EOP 35 GA-31, Locally Restoring AFW flow, Revision 000-00, 000-01, 000-02, 001-00, 002-00, 003-00, 004-00, 005-00

Condition Reports

566385	579774	1028095	1051571
1052518	1053149	1053528	1054523

Drawings

25212-26930, Feedwater System, Sheet 3, Revision 48  
25203-30011, Emergency MCC B52 22-2E FacilityZ1 Load Summary Auxiliary Building, Revision 013  
23203-30022, 125V DC Distribution Panel Schedule DV10, Revision 022  
25212-26913, High Pressure Safety Injection, Revision 41  
25203-30001, Main Single Line Diagram, Revision 40  
25203-30005, Single Line Meter and Relay Diagram 4.16kV Emergency Buses 24C and 24D, Revision 21

Miscellaneous

Millstone Plant Health Steering Committee Meeting, November 16, 2016

**Section 1R05: Fire Protection**Procedures

U2-24-FFS-BAP01-INT, MSP2 Fire Fighting Strategies, Fire Area A-20, East DC Equipment Room A

U2-24-FFS-BAP01-INT, MSP2 Fire Fighting Strategies, Fire Area A-21, West DC Equipment Room B

AOP 2579E, Fire Procedure for Hot Standby Appendix R Fire Area R-9, Revision 006-10

AOP 2579F, Fire Procedure for Hot Standby Appendix R Fire Area R-10, Revision 007-01

U3-24-FFS-BAP01-SB, MSP3 Fire Fighting Strategies, Fire Area CB-16, East Switchgear Room

U3-24-FFS-BAP01-SB, MSP3 Fire Fighting Strategies, Fire Area CB-17, West Switchgear Room

U3-24-FFS-BAP01-SB, MSP3 Fire Fighting Strategy, Fire Area CB-9, Auxiliary Building 66' Level

U3-24-FFS-BAP01-SB, MSP3 Fire Fighting Strategy, Fire Area TB-1, Lube Oil Storage Room

U2-24-FFS, Millstone Unit 2 Fire Fighting Strategies, Revision 0

SA-AA-125, Electrical Safety, Revision 21

Condition Reports

1049057	1055978	1056068	1056378
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Work Orders

53102556166	53102774150	53103000864
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**Section 1R07: Heat Sink Performance**Condition Reports

1055810

1055911

Work Orders

53102638989	53102927320	53103033751
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Miscellaneous

Calculation 94-DES-1111-M2, MP2 SWS Maximum Allowable Temperature to EDG Heat Exchangers at 1800KW and 2750KW Electrical Load Levels with 5% Tubes Plugged in Each Unit, Revision 00

Calculation Change Notice 1 to Calculation 94-DES-1111-M2, MP2 SWS Maximum Allowable Temperature to EDG Heat Exchangers at 1800KW and 2750KW Electrical Load Levels with 5% Tubes Plugged in Each Unit, Revision 00

Calculation 12-328, Equivalent Thermal Performance of Unit 2 EDG Heat Exchangers for UHS Temperature Increase, Revision 0

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

NSEM-1.01, Control of the Nuclear Simulator Engineering Manual, Revision 20

NSEM-1.02, Simulator Configuration Control Program Overview, Revision 14

TR-AA-730, Licensed Operator Biennial and Annual Operating Regualification Exam Process, Revision 9

SY-AA-FFD-101, Fitness for Duty Program, Revision 10

AOP 3581, Immediate Operator Actions, Revision 004  
 EOP 35, ES-0.0, Rediagnosis, Revision 007  
 EOP 35, ES-0.1, Reactor Trip Response, Revision 028  
 EOP 35, ECA-3.1, SGTR with Loss of Reactor Coolant Subcooled Recovery Desired, Revision 021  
 ARP 2590C-146, CEA Dropped Rod SW, Revision 0  
 AOP 2556, CEA Malfunctions, Revision 21

#### Simulator Tests

Transient Test T4, Simultaneous Trip of All RCPs, 12/15/2014  
 Transient Test T8, Max LOCA with LOOP, 12/15/2014  
 Transient Test T9, Max Size Unisolable MSL Rupture, 2/9/2015  
 Simulator Computer CPU Max Frame Time Test (TC01, MS01A), 6/15/2015  
 Simulator Computer Repeatability Test, (TC01), 6/18/2016  
 Normal Evolution Test – Surveillance SP 2604AO-001, 'A' HPSI Pump IST, 2/23/2015  
 Normal Evolution Test – Unit Performance Testing – SDM, 10/15/2015  
 NSEM-6.07, Simulator Reactor Core Validation Testing, 12/17/2015

#### Simulator Deficiency Reports

2016-2-0074	2016-2-0049	2016-2-0050	2014-2-0059	2015-2-0027
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#### Condition Reports

1052440

#### Miscellaneous

2014-2016 Two-Year LO Training Sample Plan  
 2016 Annual Operating Test Week 1 and Week 2 Scenarios and JPMs  
 December 14, 2016 Unit 3 Training Drill Manual

### **Section 1R12: Maintenance Effectiveness**

#### Procedures

DCR # M3-03001, Installation of Caldon LEFM CheckPlus System and Replacement FeedWater Venturis, Revision 0  
 OP 3353.MB4C, Main Board 4 Annunciator Response, Revision 006-02  
 SP-PP3, Functional Requirements Specification for P3, Plant Calorimetric, Revision 9, Change 2  
 SP 3673.4, Auxiliary Shutdown Panel Operability Test, Revision 011  
 ER-AA-PRS-1010, Preventive Maintenance Task Basis & Maintenance Strategy, Revision 9  
 ERP 3503, Shutdown Outside Control Room, Revision 016-03

#### Condition Reports

541496	1044595	1050628	1053789
1053741	1050800	113507	1053466
1053451	1021585	1055102	

#### Work Orders

53102711498  
 53103015937

Drawings

25212-26930 Sheet 3, FeedWater System, Revision 27

25212-26930 Sheet 4, FeedWater System, Revision 28

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

WM-AA-301 Attachment 14, High Risk Contingency Plan Actions, Revision 0

NF-AA-PRA-370, Probabilistic Risk Assessment Procedures and Methods: MRule (a)(4) Risk Monitor Guidance, Revision 16

OP-MP-6-1, Protected Equipment, Revision 21

WM-AA-301, Operational Risk Assessment, Revision 11

Condition Reports

1053042	1052338	1052965	1052697
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Work Orders

53102887344	53103021014	53102887343	53102738111
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53102943308	53102415905	53102763442	
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Miscellaneous

EOOS Version 4.1 for Millstone Unit 2 on 10/5/2016

EOOS Version 4.1 for Millstone Unit 2 on 11/10/2016

**Section 1R15: Operability Determinations and Functionality Assessments**Procedures

OP-AA-102, Operability Determinations, Revision 14

DCR # M3-03001, Installation of Caldon LEFM CheckPlus System and Replacement FeedWater Venturis, Revision 0

Condition Reports

428785	514929	541496	1039453
1052697	1044595	1050628	1053789
1053741	1050800	1053952	1048832
1051732	1053528	1052518	1051571

Work Orders

53103020130

Drawings

25212-26930 Sheet 3, FeedWater System, Revision 27

25212-26930 Sheet 4, FeedWater System, Revision 28

Miscellaneous

TCC-MP-2016-023, Circulating Water Pump Lube Water Valve 3SWP\*MOV115A Blank Flange ETE-MP-2013-1234, Revision 2, Determination of Service Life of 3SWP\*AOV39A&amp;B and 3SWP\*MOV102B&amp;C with Cast Aluminum Bronze Bodies

Update on Program for the Management of the Dealloying of Aluminum Bronze Valves and Components at Millstone Station, dated September 2, 2016

RPS-ESF-0428713, Calculation for Calorimetric Power Measurement Uncertainty Calculations, dated August 7, 2007

Millstone Plant Health Steering Committee Meeting, November 16, 2016



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

SP 3622.1, Auxiliary Feedwater Pump 3FWA\*P1A Operational Readiness Test, Revision 016-02

SPROC ENG16-3-002, SBO Diesel Computer Control and Monitoring System Wiring Verification Functional Retest

SP 2613L-001, Diesel Generator Slow Start Operability Test, Facility 2, Revision 007

SP 2601C-005, CVCS Valve Stroke and Timing IST, Facility 1, Revision 004-01

SP 2610KO-001, "B" AFW Pump and Recirc Check Valve IST, Facility 2, Revision 001-04

Condition Reports

1053042	1052338	1052965	1054696
1055607	1053073		

Work Orders

53102887343	53102955479	53102596555	53M20701300
53102678446	53103032277	53103022076	53102985806
53102943308	53102948639	51302948589	

Miscellaneous

MP3-15-01022, SBO Diesel Generator Monitoring and Control System Replacement 25203-26005, Sheet 3, PID Condensate Storage & Auxiliary Feed, Revision 60

**Section 1R22: Surveillance Testing**Procedures

SP 3622.3, Auxiliary Feed Water Pump 3FWA\*P2 Operational Readiness Test, Revision 021, 020, 019, 018, and 017

25212-041-003, Vendor Technical Manual installation, Operation, and Maintenance of Centrifugal Pump Steam Turbine, Revision 0-76

Drawings

PGG on Terry Turbine Millstone Nuclear, dated 28Jan14

**Section 1EP4: Emergency Action Level and Emergency Plan Changes**Miscellaneous

MP-26-EPI-EPMP, Millstone Power Station Emergency Plan, Revision 52

MP-26-EPI-EPMP, Millstone Power Station Emergency Plan, Revision 53

MP-26-EPI-EPMP, Millstone Power Station Emergency Plan, Revision 54

RPM 4.8.5-021, Technical Support Center, Revision 009

**Section 2RS1: Access Control to Radiologically Significant Areas**Procedures:

MP-PROC-000-RP-AA-225, Unrestricted Release of Material, Revision 5

MP-PROC-000-RP-AA-232, Radioactive Material Control, Revision 8

Documents:

Audit 15-10, "Offsite Dose Calculation Manual, Radiological Environmental Monitoring Program, Environmental Protection Plan", dated 12/16/2015

CR516292

CR528158

CR542106

CR575698

CR582718

CR1004317

CR1013670

CR1013778

Evaluation, Apparent Cause, CA3038716 for CR1045508, "Human Performance Error Leads to Unplanned Discharge to Environment".

Human Performance Review Board documentation for CR1013778

Inventory, sealed sources, dated 10/18/2016

Lesson plan, HP-00857, "Electron Capture Isotope Characteristics and Surveys"

List, RCA Exits > 100 mrem, dated 11/9/2016

Lists, Routine Radiological Surveys for Unit-2 and Unit-3

MP-HPO-14025, "2R22 Equipment Hatch Air Flow Survey", dated 5/16/2014

MP-HPO-14031m "Warehouse 9 MRRF Air Flow Survey", dated 6/26/2014

MP-HPO-14044, "3R16 Equipment Hatch Air Flow Survey", dated 10/28/2014

MP-HPO-14051, "3R16 Containment Air Flow Survey", dated 11/10/2014

MP-HPO-15026, "Unit 2 Spent Fuel Pool Air Flow Survey", dated 6/12/2015

MP-HPO-15059, "Unit 2 Containment Airflow Study (2R23)", dated 12/15/2015

MP-HPO-16004, "2016 Confirmation of Annual Inventory Reconciliation National Source Tracking System", dated 1/28/2016

MP-HPO-16020, "3R17 Airflow study to verify Previous 3R16 Study", dated 4/18/2016

MP-HPO-16043, "An In-Depth Analysis of Airflow Patterns at the Unit 3 and Unit 2 Spent Fuel Pools", dated 7/27/2016

Radiological Survey Schedule Check Sheet, Millstone Unit 3

Radiation survey figure No. 00, Unit-2, dated 10/15/15 at 2300

Radiation survey figure No. 16, Unit-3, dated 11/3/2016 at 1930

Radiation survey figure No. 16, Unit-3, dated 11/16/2016 at 0900

Radiation survey figure No. 22, Unit-2, dated 11/16/2016 at 0200

Radiation survey figure No. 23A, Unit-2, dated 10/13/2015 at 0730

Radiation survey figure No. 23A, Unit-2, dated 10/13/2015 at 1045

Radiation survey figure No. 32, Unit-3, dated 9/27/2016 at 0130

Radiation survey figure No. 32, Unit-3, dated 10/4/2016 at 0730

Surveillance, "Millstone Source Leak Test", completed 10/25/2016

Work order 53102653181

Work order 53102653182

**Section 40A1: Performance Indicator Verification**Documents

CA3037094	CA3037151	CR573851	CR1000975
CR1013071	CR1013193	CR1013342	CR1013670
CR1013778	CR1017700	CR1018111	CR1034458
CR1036964	CR1043889	CR1045508	CR1045659
CR1045740	CR1048909		

Miscellaneous

PI submittals 4Q2015 – 3Q2016

Nuclear Energy Institute Documents 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7

LER 2016-001-00, Turbine Driven Auxiliary Feedwater Pump Room HELB Door Left Open

LER 2016-003-00, Loss of Safety Function – Supplementary Leak Collection and Release System

**Section 40A2: Problem Identification and Resolution**Procedures

PI-AA-200, Corrective Action, Revision 32

CM-AA-ETE-101, Engineering Technical Evaluations, Revision 007

OP-AA-102, Operability Determinations, Revision 14

OP 3362, Radiation Monitor System Display and Control System, Revision 13

IC 3408A09-001, Check-off List for Maintenance of Radiation Monitoring Database, Revision 37

WM-AA-101, Work Order Planning, Revision 10

WM-AA-100, Work Management, Revision 27

Condition Reports

08-08586	08-08072	328821	428785
506519	506524	514929	581696
1014389	1023223	1026984	1028901
1041301	1049318	1050124	1052697
1052700	CR-06-08370	CR548491	CR548974
CR549797	CR1054065		

Work Order

M30406624	53102395844	53102702038	53102851295
53102917259	53102927356	53102937156	53102983913
53102988487	53103013785		

Miscellaneous

TCC-MP-2016-023, Blank flange for A Circulating Water Pump Lube Water valve

ETE-MP-2013-1234, Determination of Service Life of 3SWP\*AOV39A&B and 3SWP\*MOV102B&C with Cast C95400 Aluminum Bronze Bodies, Revision 2

Update of Program for the Management of the Dealloying of Aluminum Bronze Valves and Components at Millstone Station, dated September 2, 2016

**Section 40A5: Other Activities**10 CFR 50.59 Evaluations

LBDCR 13-MP3-010, Proposed Technical Specification Bases Change to Technical Specification 3/4.7.5, "Ultimate Heat Sink," 50.59 Evaluation, dated 7/25/13

S3-EV-10-003, MP3 Charging Alternate Min Flow Class Break – Operator Action 50.59 Evaluation, dated 9/22/11

10 CFR 50.59 Screened-out Evaluations

C OP 300.1 Fire Water Tank Compensatory Heating 50.59 Applicability Review, dated 9/26/16

C SP 600.5 QA Diesel Fuel Oil Ordering, Delivery and Sampling Requirements Revision 2-02 50.59 Applicability Review, dated 6/28/11

DC M2-10-01183-000, Nukon Insulation with Tungsten Shielding: MP2 Pressurizer Spray Line 50.59 Screen, dated 2/23/11

DM2-00-0129-04, Normal Position of Valves 2-RC-003 and 2-RC-045 50.59 Screen, dated 6/25/04

DM2-00-0373-00, E.B.F.S. Heater X61B Cable/Wiring Reclassification to Match Non-QA Classification of EBFS Heater 50.59 Screen, dated 3/27/02

DM2-00-0496-05, Remote Manual Operator for Dampers 2-HV-313 and 2-HV-316 50.59 Screen, dated 7/25/06

DM3-00-0065-07, Temporary Change to Install the Polar Crane (3MIIR-CRNI) Pendant Control Station 50.59 Screen, dated 3/27/07

ETE-CME-2012-1006 50.59 Applicability Review, dated 7/11/16

ETE-MP-2011-0067 50.59 Applicability Review, dated 6/27/16

LBDCR 10-MP2-016, Clarification of MPS2 TS Bases 314.5.4 Regarding the Usable Volume of RWST 50.59 Screen, dated 10/19/10

LBDCR 10-MP3-003, MPS3 Technical Specification (TS) Bases Regarding the Decay Time Definition Associated with "Recently Irradiated Fuel" (RIF) 50.59 Screen, dated 2/5/10

LBDCR 12-MP3-011, Revise TS Bases Section 3.6.6.2 Regarding Secondary Containment 50.59 Screen, dated 2/22/13

LBDCR 13-MP2-016, Technical Specification Surveillance Requirement 4.4.3.1.c Bases Change 50.59 Applicability Review, dated 4/11/13

LBDCR 15-MP2-003, Clarification of an Operable Shutdown Cooling Train 50.59 Screen, dated 3/13/15

M3-EV-05-0008 Determination of Allowable ECCS Gas Accumulations in Support of Surveillance 4.5.2.b.1 Revision 0 50.59 Screen, dated 4/20/05

MP3-10-01178 Revise 3FW3-P1 Low Suction Pressure Trip Logic to 2 out of 3 50.59 Screen, dated 7/26/11

MP3-UCR-2010-010, Revision of Unit 3 FSAR Section 9.5.5.1 50.59 Screen, dated 8/26/15

MP 3720CO EDG Engine Cylinder Liner and Water – Jacket Inspection and Maintenance Revision 001-02 50.59 Applicability Review, dated 6/24/16

MPS2-SCRN-2016-0054-0, CR1033361/CA3028739 Operability Determination 50.59 Screen, dated 4/12/16

MPS2-SCRN-2016-0124-0, ETE-MP-2011-0067 50.59 Screen, dated 7/19/16

OP 2207 Plant Cooldown Revision 029-00 50.59 Applicability Review, dated 7/13/16

OP 2304C21 Filling and Venting Boric Acid Pump A Revision 001-00 50.59 Applicability Review, dated 7/11/16

OP 2330A Section 4.30 Revision 25-00-OT01 50.59 Applicability Review, dated 4/29/16

OP 2350 Refueling Water Storage Tank Temperature Control Revision 15-01 50.59 Screen, dated 12/17/12

OP 3304C Primary Makeup and Chemical Addition Revision 022-09 50.59 Applicability Review, dated 6/21/16

OP 3314D ESF Building Ventilation and Air Conditioning Revision 12-08 50.59 Applicability Review, dated 7/21/14

OP 3325C Cathodic Protection System Revision 006-03 50.59 Applicability Review, dated 6/20/16

SP 2613L Diesel Generator Slow Start Operability Test, Facility 2 Revision 5-08 50.59 Applicability Review, dated 6/11/14

SP 2669A-003 Unit 2 Outside Rounds Revision 039-00 50.59 Applicability Review, dated 7/13/16

SP 2853-001 Unit 2 Steam Generator Blowdown Radiation Monitor RM 4262 Non-Functional Revision 005-01 50.59 Applicability Review, dated 6/28/16

SP 3446C01 AMSAC Calibration (ATWS Mitigation System Actuation Circuitry) Revision 003-00  
 50.59 Applicability Review, dated 6/27/16  
 VPROC ENG11-3-010/001 50.59 Applicability Review, dated 7/12/16

#### Assessments, Audits, and Third Party Independent Reviews

Audit 16-05, Design Control & Engineering Programs, dated 7/21/16  
 CA147603, NOD Review of Millstone 2 Temporary Plant Change MMOD DM2-00-0200-09, R0  
 and 50.59 Evaluation S2-EV-09-0002, R0, dated 9/29/09  
 CA277102, 50.59 Gap to Excellence Performance Analysis, dated 12/14/15  
 PIR No. 1020010, Formal Self-Assessment 10 CFR 50.59 Process, dated 4/14/15  
 PIR No. PA3015847, 50.59 Procedure Applicabilities, ETE Screens, and OPS APC Screens  
 Self-Assessment, dated 9/20/16  
 PLS-16-107, Transmittal of Final Report from PLS "Third Party Independent Formal Sampling  
 Program of Products Developed Using the Dominion Nuclear Connecticut (DNC) 10  
 CFR 50.59 Programs and Procedures," dated 5/20/16  
 PLS-16-108, Transmittal of Addendum 1 to Final Report from PLS "Third Party Independent  
 Formal Sampling Program of Products Developed Using the Dominion Nuclear  
 Connecticut (DNC) 10 CFR 50.59 Programs and Procedures," dated 5/20/16

#### Calculations

12-328, Equivalent Thermal Performance of the Unit 2 EDG Heat Exchangers for UHS  
 Temperature Increase, Revision 0

#### Corrective Action Condition Reports (CRs)

0114580	0324869	0350019	0362880
0385996	0401952	0451977	0456752
0458674	0483716	0484281	0551068
0553967	0553968	0560257	0571411
0573919	0575063	0577964	0578418
0579590	0579655	0578177	0580173
0580178	0581988	0582385	1008518
1012627	1015029	1017853	1017945
1018399	1018784	1018890	1021625
1023397	1024407	1024467	1024833
1026300	1028080	1028322	1028632
1029321	1029834	1029998	1030668
1030994	1032223	1032224	1032226
1033361	1033733	1036534	1036640
1036651	1036670	1037622	1037745
1037783	1037803	1037807	1038028
1038080	1040679	1041971	1045128
1046980	1049281	1051090	1051119
1051181	1052820*	1053287	1053556
1053557	1054036*		

\*CR written as a result of this inspection

Design and Licensing Bases Documents

Serial No. 07-0790, Dominion Nuclear Connecticut Letter to USNRC, "Dominion Nuclear Connecticut, Inc. Millstone Power Station Units 2 and 3 Application for Technical Specification Improvement Regarding Control Room Habitability LBDCRs 07-MP2-013 and 07-MP3-033 Response to Request for Additional Information," dated 12/7/07

Drawings

25212-26911, Millstone Power Station Unit 3 Fuel Pool Cooling & Purification System Piping & Instrumentation Diagram, Revision 38

25212-26915, Millstone Power Station Unit 3 Quench Spray & H<sub>2</sub> Recombiner Piping & Instrumentation Diagram, Revision 37

Effectiveness Reviews and Causal Evaluations

ACE No. 019757, NRC Review Concludes MP2 and MP3 Are Not in Compliance with GDC 17 Apparent Cause Evaluation, Revision 0

ACE No. 019918, Violation of Technical Specification 3.7.3.1 'C' RBCCW Apparent Cause Evaluation, Revision 0

ACE No. 019921, NENG L2 ACE- AV#1and #2 - Changes to Section 14.6.1 of the Millstone Unit 2 FSAR and Failure to Provide Complete and Accurate Information to the NRC Apparent Cause Evaluation, Revision 0

ACE No. 019923, Failure to Obtain an Approved License Amendment Prior to FSAR Change Related to Irradiated Fuel Decay Time Apparent Cause Evaluation, Revision 0

ACE No. 019925, CDBI Exit, Potential Traditional Enforcement Level IV Finding Apparent Cause Evaluation, Revision 0

CA3023264, Common Cause Analysis Effectiveness Review (CCA 3009063), dated 10/26/16

CA304008, Apparent Cause Evaluation Effectiveness Review (ACE No. 019918), dated 12/7/15

CA305086, Apparent Cause Evaluation Effectiveness Review (ACE No. 019918), dated 2/12/16

CCA 3009063, Common Cause Analysis of 10 CFR 50.59 Issues Identified after July 1, 2012, in Response to Confirmatory Order Serial Number 15-452 dated August 26, 2015, Revision 1

CR-04-09890, Millstone 3 Oil Leakage Will Exceed the Oil Reservoir Capacity within the SIH Pump's Design Run Time Root Cause Evaluation, dated 12/16/04

EFR000450, CR553967 (RCE001123) Effectiveness Review, dated 3/23/16

PI-AA-200-2002 Attachment 2, Apparent Cause Evaluation Effectiveness Review (ACE No. 019925), dated 6/22/16

RCE No. 001123, NRC LOOP SIT Exit Includes Apparent Violation Severity Level III Millstone Unit 2/3 Root Cause Evaluation, Revision 1

Miscellaneous

2607, Engineering Leadership Improvement Initiative Level 1 Report, dated 2/2/15

CARB Meeting Minutes for October 26, 2016 (CCA 3009063 Effectiveness Review)

DESENG-14-31, Quality Review of 50.59 Screenings Memorandum, dated 7/30/14

Engineering Information Bulletin, "CR1044190: NAPS 50.59 Screen Receives an Unacceptable Rating by 50.59 Quality Review Team," dated 8/10/16

INPO Engineering Vice Presidents Meeting Agenda, Enabling the Nuclear Promise, for meeting held October 11 - 12, 2016

Millstone Communication, Millstone Common Cause Evaluation Results for 10 CFR 50.59 Confirmatory Order – A Message from Sonny Stanley, dated 3/30/16

Millstone Licensing Proofreader Checklist – Outgoing Correspondence, Revision 4

Millstone Line Separation Project (for the Elimination of SLOD), dated 1/25/12

Millstone Power Station Management Review Meeting Presentation, dated 11/15/16 & 7/19/16

Millstone Unit 2 Confirmatory Order EA-13-188 Industry Presentation, Revision 6  
NEI 96-07, Guidelines for 10 CFR 50.59 Evaluations, Revision 1  
NRC Inspection Manual Chapter 0326, Operability Determinations & Functionality Assessments  
for Conditions Adverse to Quality or Safety, dated 12/3/15  
NRC Regulatory Guide 1.183, Alternative Radiological Source Terms for Evaluating Design  
Basis Accidents at Nuclear Power Reactors, July 2000  
NUREG-1022, Event Report Guidelines 10 CFR 50.72 and 50.73, Revision 3

NRC Inspection Reports and Associated Correspondence

Millstone Power Station Units 2 And 3 - Notice of Violation and Exercise of Enforcement  
Discretion - NRC Inspection Report Nos. 05000336/2015008 and 05000423/2015008,  
dated 2/10/15  
Millstone Power Station Units 2 and 3 - NRC Component Design Bases Inspection Report  
05000336/2015007 and 05000423/2015007, dated 6/12/15  
Serial No. 14-451, Letter from Dominion Nuclear Connecticut to U.S. Nuclear Regulatory  
Commission, Millstone Power Station Units 2 and 3 Response to an Apparent Violation  
in NRC Special Inspection Report 05000336/2014011 and 05000423/2014011; EA-14-  
126, dated 10/14/14  
Serial No. 15-073, Letter from Dominion Nuclear Connecticut to U.S. Nuclear Regulatory  
Commission, Millstone Power Station Units 2 and 3 Reply to Notice of Violation EA-14-  
126, dated 3/31/15

Operability Determinations and Operations Standing Orders

CA3028739, MP2 "C" RBCCW P11CP Outboard Bearing Oil Leak Prompt Operability  
Determination, dated 4/12/16  
Millstone U2 Standing Order SO-15-012, Direction/Clarification for Implementation of OP-AA-  
102 Regarding Evaluation of Oil/Coolant Leaks, dated 5/2/15  
Millstone U3 Standing Order SO-15-010, Direction/Clarification for Implementation of OP-AA-  
102 Regarding Evaluation of Oil/Coolant Leaks, dated 5/2/15  
Millstone U2 Standing Order SO-16-023, Tech Spec License Amendment 328, Removal of  
Severe Line Outage Detection from the Offsite Power System, dated 8/26/16

Operating Experience

NRC Information Notice No. 2012-01: Seismic Considerations – Principally Issues Involving  
Tanks, dated 1/26/12

Procedures

CM-AA-400, 10 CFR 50.59 and 10 CFR 72.48 - Changes, Tests, and Experiments, Revision 8  
CM-AA-DDC-201, Design Changes, Revision 17  
CM-AA-ECR-1001, Engineering Challenge Reviews, Revision 5  
CM-AA-QRT-101, Engineering Quality Review Teams, Revision 1  
CM-AA-SAR-101, Updating Safety Analysis Report (SAR), Revision 7  
C OP 200.18, Time Critical Action Validation and Verification, Revision 4  
C SP 600.5, QA Diesel Fuel Oil Ordering, Delivery and Sampling Requirements, Revision 2-02  
DNAP-3004, Dominion Program for 10 CFR 50.59 and 10 CFR 72.48 - Changes, Tests, and  
Experiments, Revision 4  
EN 31173, Refueling Water Storage Tank (RWST) or Boron Recovery Tanks (BRT) Silica  
Cleanup Using Reverse Osmosis, Revision 4  
EOP 35 E-1, Loss of Reactor or Secondary Coolant, Revision 26  
EOP 35 ES-1.2, Post LOCA Cooldown and Depressurization, Revision 20  
LI-AA-101, License Basis Document Changes Process, Revision 8  
LI-AA-200, NRC Licensing Correspondence, Revision 4

LI-AA-600, Facility Safety Review Committee (FSRC), Revision 12  
 MP 2701F, Lubrication, Revision 20  
 MP 3710AA, Lubrication Program, Revision 10  
 OP 2305B, RWST Purification, Revision 1  
 OP 2330A, RBCCW System, Revision 25-00-OT01  
 OP 2350, Refueling Water Storage Tank Temperature Control, Revision 15-01  
 OP 3305, Fuel Pool Cooling and Purification, Revision 24  
 OP 3314D, ESF Building Ventilation and Air Conditioning, Revision 12-08  
 OP-AA-102, Operability Determination, Revisions 12, 13, & 14  
 OP-AA-102-1001, Development of Technical Basis to Support Operability Determinations, Revision 11  
 PI-AA-100-1003, Self Evaluation, Revision 16  
 PI-AA-200, Corrective Action, Revision 32  
 PI-AA-200-2002, Effectiveness Reviews, Revision 10  
 PI-AA-300, Cause Evaluation, Revision 11  
 PI-AA-300-3001, Root Cause Evaluation, Revision 8  
 PI-AA-300-3002, Apparent Cause Evaluation, Revision 13  
 RAC 05, Reportability Determinations and Licensee Event Reports, Revision 5  
 SP 2609A, EBFS Monthly Operability Test, Facility 1, Revision 15-08  
 SP 2613L Diesel Generator Slow Start Operability Test, Facility 2, Revision 5-08  
 SP 2669A, PEO Rounds, Revision 19

#### System Health Reports, Maintenance Rule Action Plans, & Trending

50.59 Quality Review Team Quarterly Summary, 2nd Quarter 2016  
 50.59 Quality Review Team Quarterly Summary, 3rd Quarter 2016  
 CA3018258, MP2 RBCCW P11C "C" RBCCW Pump Outboard Bearing Oil Leakage MR(a)(1) Action Plan, dated 2/22/16  
 Unit 2 High Pressure Safety Injection System Health Report, Q3-2016  
 Unit 2 RBCCW System Health Report, Q3-2016  
 Unit 2 Service Water System Health Report, Q3-2016  
 Unit 3 High Head Safety Injection System Health Report, Q3-2016  
 Unit 3 Reactor Plant Component Cooling System Health Report, Q3-2016  
 Unit 3 Service Water System Health Report, Q3-2016

#### Technical Evaluations

DCR M3-05002, Charging System Alternate Minimum Flow Line Modifications, Revision 1  
 ETE-MP-2015-1083, Millstone Unit 3 Safety Equipment Mission Times, Revision 0  
 ETE-MP-2015-1084, Millstone Unit 2 Safety Equipment Mission Times, Revision 0  
 M3-EV-05-0008, Determination of Allowable ECCS Gas Accumulations in Support of Surveillance 4.5.2.b.1, Revision 5

#### Training

10 CFR 50.59 Screening Refresher – 2015 Lesson Plan, dated 9/14/15  
 10 CFR 50.59 Screening Refresher Training September 2015 Presentation, Revision 3  
 50.59 Biennial CBT Training, dated 11/1/16  
 C16307L, Operability Evaluations & Equipment Qualification LORP Lesson Plan, Revision 0  
 Confirmatory Order Commitment #15, Repeat Regulatory Sensitivity Training Plan, dated 11/14/16  
 Dominion Memorandum, D. A. Heacock to All Nuclear Personnel, CNO Remarks on Providing Complete and Accurate Information to the NRC, dated 9/14/15  
 DQR-DES-ENG-AA-14 50.59 Screens Qualification Listing, dated 10/26/16



DQR-DES-ENG-AA-16 50.59 Evaluations Qualification Listing, dated 10/26/16  
ES01309, 10 CFR 50.59 Screening Refresher, Revision 0  
MPS Engineering Support Program (ESP) Recurring Training Plan, dated 11/17/14  
Operability Evaluations and Equipment Qualification PowerPoint Presentation, dated 3/9/16  
Regulatory Sensitivity and Awareness Training Video, Understanding the NRC/Licensee Interface, dated 12/16/15  
TR-AA-100 Attachment 1, Engineering Training Request and Needs Analysis, dated 7/30/14  
TR-AA-100 Attachment 1, ESCT Training Request and Needs Analysis, dated 12/7/11  
TR-AA-100 Attachment 1, SM/STA and LORP Training Request and Needs Analysis, dated 6/29/15  
TR-AA-100 Attachment 2, 50.59 Gap to Excellence Performance Analysis & Performance Improvement Instrument, dated 4/1/14  
TR-AA-100 Attachment 2, Operability Determination Performance Analysis & Performance Improvement Instrument, dated 10/6/15  
TR-AA-510 Attachment 14, Curriculum Review Committee Meeting Agenda and Minutes, dated 3/2/15  
TR-AA-TPG-0100, Nuclear Employee Training (NET) Training Program Guide, Revision 9  
Unit 2 Licensed Operator Requalification Training (LORP) Cycle 16-3 Training Attendance Records, 5/17/16 to 6/17/16  
Unit 3 Licensed Operator Requalification Training (LORP) Cycle 16-3 Training Attendance Records, 5/17/16 to 6/17/16

Work Orders

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## LIST OF ACRONYMS

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
ACE	apparent cause evaluation
ADAMS	Agencywide Document Access and Management System
ADR	alternate dispute resolution
CAP	corrective action program
CAPR	corrective action to prevent recurrence
CARB	Corrective Action Review Board
CCA	common cause analysis
CR	condition report
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
EAL	emergency action level
EDG	emergency diesel generator
FSAR	Final Safety Analysis Report
FSRC	Facility Safety Review Committee
HRA	high radiation area
IMC	Inspection Manual Chapter
INPO	Institute of Nuclear Power Operations
IP	inspection procedure
JPM	job performance measure
LCO	limiting condition for operation
LER	licensee event report
MDAFW	motor driven auxiliary feedwater
NCV	non-cited violation
NEI	Nuclear Energy Institute
NOV	Notice of Violation
NRC	Nuclear Regulatory Commission, U.S
PAT	plant access training
PI	performance indicator
PLS	Preferred Licensing Services
PORV	power operated relief valve
RBCCW	reactor building closed cooling water
RCE	root cause evaluation
RCP	reactor coolant pump
RCS	reactor coolant system
SL	severity level
SLOD	severe line outage detection
SPS	special protection system
SSC	structure, system, or component
TDAFW	turbine driven auxiliary feedwater
TS	technical specification
UFSAR	Updated Final Safety Analysis Report
VHRA	very high radiation area