



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I**  
2100 RENAISSANCE BOULEVARD, SUITE 100  
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

August 31, 2012

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

**SUBJECT: MILLSTONE POWER STATION – NRC PROBLEM IDENTIFICATION AND  
RESOLUTION INSPECTION REPORT 05000336/2012010 AND  
05000423/2012010**

Dear Mr. Heacock:

On August 2, 2012, the United States Nuclear Regulatory Commission (NRC) completed an inspection at your Millstone Power Station, Units 2 and 3. The enclosed report documents the inspection results, which were discussed on August 2, 2012, with Mr. Stephen Scace, Site Vice President, and other members of your staff.

This inspection examined activities conducted under your license as they relate to identification and resolution of problems and compliance with the Commission's rules and regulations and conditions of your license. Within these areas, the inspection involved examination of selected procedures and representative records, observations of activities, and interviews with personnel.

Based on the samples selected for review, the inspectors concluded that Dominion was generally effective in identifying, evaluating, and resolving problems. In most cases, Dominion personnel identified problems, entered them into the corrective action program at a low threshold, and prioritized issues commensurate with their safety significance. Dominion appropriately screened issues for operability and reportability, and performed causal analyses that appropriately considered extent of condition, generic issues, and previous occurrences. The inspectors also determined that Dominion typically implemented corrective actions to address the problems identified in the corrective action program in a timely manner.

The inspectors concluded that Dominion adequately identified, reviewed, and applied relevant industry operating experience to Millstone Power Station operations. In addition, based on those items selected for review, the inspectors determined that in general, Dominion's self-assessments and audits were thorough.

This report documents three NRC-identified findings of very low safety significance (Green). Two of the findings were determined to involve violations of NRC requirements. However, because of the very low safety significance and because they have been entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs), consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest any NCV in this report, you should provide a written response within 30 days of the date of this inspection report,

with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington DC, 20555-0001; and the NRC Senior Resident Inspector at Millstone Power Station. In addition, if you disagree with the cross-cutting aspects assigned to the findings in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Senior Resident Inspector at Millstone Power Station.

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

Sincerely,

**/RA/**

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

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

Enclosure: Inspection Report 05000336/2012010 and 05000423/2012010  
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington DC, 20555-0001; and the NRC Senior Resident Inspector at Millstone Power Station. In addition, if you disagree with the cross-cutting aspects assigned to the findings in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Senior Resident Inspector at Millstone Power Station.

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

Sincerely,

/RA/

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

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

Enclosure: Inspection Report 05000336/2012010 and 05000423/2012010  
w/Attachment: Supplemental Information

Distribution w/encl: (via email)

W. Dean, RA  
D. Lew, DRA  
D. Roberts, DRP  
J. Clifford, DRP  
C. Miller, DRS  
P. Wilson, DRS  
S. Kennedy, RI OEDO  
R. Bellamy, DRP  
R. Powell, DRP  
T. Setzer, DRP  
E. Keighley, DRP

J. DeBoer, DRP  
J. Ambrosini, DRP, SRI  
B. Haagensen, DRP, RI  
J. Krafty, DRP, RI  
C. Kowalyshyn, Admin  
E. Miller, DRP  
S. Ibarrola, DRP  
RidsNrrPMMillstone Resource  
RidsNrrDorILp1-1 Resource  
ROPreports Resource

DOCUMENT NAME: G:\DRP\BRANCH TSAB\Inspection Reports\Millstone PI&R 2012\Millstone 2012  
PIR Report 2012010 rev1.docx  
ADAMS ACCESSION NUMBER: **ML12244A160**

<input checked="" type="checkbox"/> SUNSI Review		<input checked="" type="checkbox"/> Non-Sensitive <input type="checkbox"/> Sensitive		<input checked="" type="checkbox"/> Publicly Available <input type="checkbox"/> Non-Publicly Available	
OFFICE	RI/DRP	RI/DRP	RI/DRP		
NAME	TSetzer	RPowell	RBellamy		
DATE	08/29/12	08/30/12	08/31/12		

OFFICIAL RECORD COPY

**U.S. NUCLEAR REGULATORY COMMISSION**

## REGION I

Docket Nos.: 50-336, 50-423

License Nos.: DRP-65, NPF-49

Report Nos.: 05000336/2012010 and 05000423/2012010

Licensee: Dominion Nuclear Connecticut, Inc.

Facility: Millstone Power Station, Units 2 and 3

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

Dates: July 16, 2012 through August 2, 2012

Team Leader: Thomas C. Setzer, Senior Project Engineer  
Division of Reactor Projects (DRP)

Inspectors: Brian C. Haagensen, Millstone Resident Inspector, DRP  
Sherlyn D. Ibarrola, Project Engineer, DRP  
Eric D. Miller, Project Engineer, DRP

Approved by: Ronald R. Bellamy, Chief  
Reactor Projects Branch 5  
Division of Reactor Projects

Enclosure

## SUMMARY OF FINDINGS

IR 05000336/2012010 and 05000423/2012010; 07/16/2012 – 08/02/2012; Millstone Power Station; Biennial Baseline Inspection of Problem Identification and Resolution. The inspectors identified three findings in the areas of Prioritization and Evaluation of Issues; Effectiveness of Corrective Actions; and Self-Assessments and Audits.

This NRC team inspection was performed by three regional inspectors and one resident inspector. The inspectors identified three findings of very low safety significance (Green) during this inspection. Two findings were determined to involve violations of NRC requirements. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using NRC Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or assigned a severity level after NRC management review. Cross-cutting aspects associated with findings are determined using IMC 0310, "Components Within the Cross-Cutting Areas." The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

### Problem Identification and Resolution

The inspectors concluded that Dominion was generally effective in identifying, evaluating, and resolving problems. In most cases, Dominion personnel identified problems, entered them into the corrective action program at a low threshold, and prioritized issues commensurate with their safety significance. Dominion appropriately screened issues for operability and reportability, and performed causal analyses that appropriately considered extent of condition, generic issues, and previous occurrences. The inspectors also determined that Dominion typically implemented corrective actions to address the problems identified in the corrective action program in a timely manner. However, the inspectors identified two violations of NRC requirements in the areas of Prioritization and Evaluation of Issues, and Effectiveness of Corrective Actions.

The inspectors concluded that Dominion adequately identified, reviewed, and applied relevant industry operating experience to Millstone Power Station operations. In addition, based on those items selected for review, the inspectors determined that in general, Dominion's self-assessments and audits were thorough. However, the inspectors identified one finding in the area of Self-Assessments and Audits that was determined not to be a violation of NRC requirements.

Based on the interviews the inspectors conducted over the course of the inspection, observations of plant activities, and reviews of individual corrective action program and employee concerns program issues, the inspectors did not identify any indications that site personnel were unwilling to raise safety issues, nor did they identify any conditions that could have had a negative impact on the site's safety conscious work environment.

### **Cornerstone: Mitigating Systems**

- Green. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criteria XVI, "Corrective Action," for Dominion's failure to take prompt and effective corrective actions for conditions adverse to quality involving degradation of the Unit 3 turbine driven auxiliary feedwater (TDAFW) pump trip latch mechanism. Dominion did not identify the cause of the trip latch mechanism degradation until after multiple surveillance test failures had occurred.

In response to questions from NRC inspectors, Dominion performed additional troubleshooting and determined that the linkage was not properly lubricated, and the linkage impact gap was out of adjustment. Dominion lubricated and adjusted the linkage, and declared the TDAFW pump operable after a successful retest.

The inspectors determined that this issue was more than minor because it is similar to the more than minor example 4.f of Inspection Manual Chapter (IMC) 0612, Appendix E, "Examples of Minor Issues." Additionally, the finding was more than minor because it is associated with the Equipment Performance attribute of the Mitigating Systems cornerstone, and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The finding was determined to be of very low safety significance (Green) because the finding does not represent a loss of system and/or function, does not represent an actual loss of function of at least a single train for greater than its technical specification allowed outage time or two separate safety systems out-of-service for greater than its technical specification allowed outage time, and does not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's Maintenance Rule program for greater than 24 hrs. The inspectors determined that this finding had a cross-cutting aspect in the Problem Identification and Resolution cross-cutting area, Corrective Action Program component, because Dominion did not thoroughly evaluate the problem such that the resolution addressed the causes [P.1(c)]. (Section 4OA2.1.c)

### **Cornerstone: Barrier Integrity**

- Green. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criteria XVI, "Corrective Action," for Dominion's failure to take timely corrective actions for conditions adverse to quality involving the degradation of the closing capability of four Unit 3 main feedwater isolation valves. Dominion has deferred correcting this condition adverse to quality for over a period of six years (three refueling outages), and correction of the degraded condition is currently scheduled for the next refueling outage (April 2013).

The inspectors determined this issue was more than minor because it is similar to the more than minor examples, 4.f and 4.g of NRC IMC 0612, Appendix E, "Examples of Minor Issues." Additionally, the finding is more than minor because it is associated with the Design Control attribute of the Barrier Integrity cornerstone, and adversely affected the cornerstone's objective of providing reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. The inspectors determined the finding was of very low safety significance (Green) because the issue did not represent an actual open pathway in the physical integrity of the reactor containment. The inspectors determined this finding had a cross-cutting aspect in the Human Performance cross-cutting area, Decision Making component, because Dominion did not use conservative assumptions in decision making when delaying the repairs [H.1(b)]. (Section 4OA2.1.c)

### **Other Findings**

- Green. The inspectors identified a finding (FIN) of very low safety significance (Green) for Dominion's failure to perform procedurally required effectiveness reviews for numerous formal self-assessments. Consequently, Dominion missed opportunities to identify potential

corrective actions for resolution in the corrective action program. Dominion has entered the issue into the corrective action program (CR482135).

The inspectors determined that this finding was more than minor because it is similar to IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," example 3.j; in that, it represents a programmatic deficiency that could lead to worse errors if uncorrected. This finding was of very low safety significance (Green) because the finding does not represent a loss of system and/or function, does not represent an actual loss of function of at least a single train for greater than its technical specification allowed outage time or two separate safety systems out-of-service for greater than its technical specification allowed outage time, and does not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's Maintenance Rule program for greater than 24 hrs. This finding is not associated with an NRC Reactor Oversight Process cornerstone. The inspectors determined that this finding had a cross-cutting aspect in the Human Performance cross-cutting area, Work Practices component, because Dominion personnel failed to follow procedures. [H.4(b)]. (Section 4OA2.3.c)

## REPORT DETAILS

### 4. OTHER ACTIVITIES (OA)

#### 4OA2 Problem Identification and Resolution (71152B)

This inspection constitutes one biennial sample of problem identification and resolution as defined by Inspection Procedure 71152. All documents reviewed during this inspection are listed in the Attachment to this report.

#### .1 Assessment of Corrective Action Program Effectiveness

##### a. Inspection Scope

The inspectors reviewed the procedures that described Dominion's corrective action program at Millstone Power Station. To assess the effectiveness of the corrective action program, the inspectors reviewed performance in three primary areas: problem identification, prioritization and evaluation of issues, and corrective action implementation. The inspectors compared performance in these areas to the requirements and standards contained in 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," and Dominion procedure PI-AA-200, "Corrective Action." For each of these areas, the inspectors considered risk insights from the station's risk analysis and reviewed condition reports selected across the seven cornerstones of safety in the NRC's Reactor Oversight Process. Additionally, the inspectors attended multiple Condition Report Review Team (CRT) meetings and Corrective Action Assignment Review Team (CAART) meetings. The inspectors selected items from the following functional areas for review: engineering, operations, maintenance, emergency preparedness, radiation protection, chemistry, physical security, and the Maintenance Rule program.

##### (1) Effectiveness of Problem Identification

In addition to the items described above, the inspectors reviewed system health reports, a sample of completed corrective and preventative maintenance work orders, completed surveillance test procedures, operator logs, and periodic trend reports. The inspectors also completed field walkdowns of various systems for both Unit 2 and Unit 3, such as the emergency core cooling pump rooms, auxiliary feedwater pump room, intake structure, turbine building, central alarm station, secondary alarm station, armory, and cable spreading rooms. Additionally, the inspectors reviewed a sample of condition reports written to document issues identified through internal self-assessments, audits, emergency preparedness drills, and the operating experience program. The inspectors completed this review to verify that Dominion entered conditions adverse to quality into their corrective action program as appropriate.

##### (2) Effectiveness of Prioritization and Evaluation of Issues

The inspectors reviewed the evaluation and prioritization of a sample of condition reports issued since the last NRC biennial Problem Identification and Resolution inspection completed in February 2010. The inspectors also reviewed condition reports that were assigned lower levels of significance that did not include formal cause evaluations to ensure that they were properly classified. The inspectors' review included the



appropriateness of the assigned significance, the scope and depth of the causal analysis, and the timeliness of resolution. The inspectors assessed whether the evaluations identified likely causes for the issues and developed appropriate corrective actions to address the identified causes. Further, the inspectors reviewed equipment operability determinations, reportability assessments, and extent-of-condition reviews for selected problems to verify these processes adequately addressed equipment operability, reporting of issues to the NRC, and the extent of the issues.

### (3) Effectiveness of Corrective Actions

The inspectors reviewed Dominion's completed corrective actions through documentation review and, in some cases, field walkdowns to determine whether the actions addressed the identified causes of the problems. The inspectors also reviewed condition reports for adverse trends and repetitive problems to determine whether corrective actions were effective in addressing the broader issues. The inspectors reviewed Dominion's timeliness in implementing corrective actions and effectiveness in precluding recurrence for significant conditions adverse to quality. The inspectors also reviewed a sample of condition reports associated with selected NCVs and findings to verify that Dominion personnel properly evaluated and resolved these issues. In addition, the inspectors expanded the corrective action review to five years to evaluate Dominion's actions related to Unit 2 safety-related inverter issues.

#### b. Assessment

##### (1) Effectiveness of Problem Identification

Based on the selected samples, plant walkdowns, and interviews of site personnel in multiple functional areas, the inspectors determined that Dominion identified problems and entered them into the corrective action program at a low threshold. Dominion staff at Millstone Power Station initiated approximately 38,000 condition reports between January 2010 and July 2012. The inspectors observed supervisors at the CRT and CAART meetings appropriately questioning and challenging condition reports to ensure clarification of the issues. Based on the samples reviewed, the inspectors determined that Dominion trended equipment and programmatic issues, and appropriately identified problems in condition reports. The inspectors verified that conditions adverse to quality identified through this review were entered into the corrective action program as appropriate. Additionally, inspectors concluded that personnel were identifying trends at low levels.

During a plant walkdown, the inspectors identified two degraded conditions that had not been previously entered into the Dominion corrective action program:

- A radiological floor drain label was found to be covering a portion of a floor drain in the Unit 3 safeguards building, elevation 37'. The label was moved during painting of the floor and was blocking a portion of the drain. This was a performance deficiency because Dominion's work control program failed to identify the improperly placed label following work activities in the area. Dominion immediately entered the issue into the corrective action program as CR481939, and properly installed the label. Dominion evaluated the issue and determined the function of the drain was not adversely impacted by the label. The inspectors determined that because the label did not impact the function of

the floor drain, and that the issue was isolated and not programmatic in nature, this performance deficiency was minor and not subject to enforcement action in accordance with the NRC's Enforcement Policy.

- An extension ladder was found to be tied off to electrical conduit located in the Unit 2 'B' safeguards room. The ladder was being stored in the area to allow personnel access to an upper mezzanine area of the room. The inspectors questioned whether the ladder was adequately restrained to withstand a seismic event, and how long the ladder had been in the area. Dominion performed an evaluation and concluded that the ladder was properly restrained; however, it was not being stored in accordance with site housekeeping procedures. This was a performance deficiency because Dominion's housekeeping program failed to identify the improperly stored ladder. Dominion immediately entered the issue into the corrective action program as CR481975, removed the ladder, and determined that the ladder would not adversely impact the operability of safety-related equipment during a seismic event. The inspectors determined that because the issue did not affect equipment operability and was isolated and not programmatic in nature, this performance deficiency was minor and not subject to enforcement action in accordance with the NRC's Enforcement Policy.

## (2) Effectiveness of Prioritization and Evaluation of Issues

The inspectors determined that, in general, Dominion appropriately prioritized and evaluated issues commensurate with the safety significance of the identified problem. Dominion screened condition reports for operability and reportability, categorized the condition reports by significance, and assigned actions to the appropriate department for evaluation and resolution. The condition report screening process considered human performance issues, radiological safety concerns, repetitiveness, adverse trends, and potential impact on the safety conscious work environment.

Based on the sample of condition reports reviewed, the inspectors noted that the guidance provided by Dominion corrective action program implementing procedures appeared sufficient to ensure consistency in categorization of issues. Operability and reportability determinations were generally performed when conditions warranted and in most cases, the evaluations supported the conclusion. Causal analyses appropriately considered the extent of condition or problem, generic issues, and previous occurrences of the issue. However, the inspectors identified one example of more than minor significance where Dominion personnel did not take timely corrective actions to correct a known degraded condition for Unit 3 main feedwater isolation valves. This finding is documented in Section 4OA2.1.c.

## (3) Effectiveness of Corrective Actions

The inspectors concluded that corrective actions for identified deficiencies were, in general, timely and adequately implemented. For significant conditions adverse to quality, Dominion, in general, identified actions to prevent recurrence. The inspectors concluded that corrective actions to address the sample of NRC NCVs and findings since the last problem identification and resolution inspection were, in general, timely and effective. However, the inspectors found the following examples where corrective actions were not completed or fully effective to address an issue:

### Millstone Corrective Action Program Workflow Extension Policy

In April 2012, Dominion implemented a new policy governing extensions of condition report due dates. The new policy was put in effect based on an assessment Dominion had completed which concluded the station had been inappropriately or excessively extending the due dates of corrective actions. If a due date is to be extended, the new policy requires specific levels of approval (Manager, Director, Site Vice President) based on the significance of the issue or number of previous extensions. The inspectors reviewed a list of 95 condition reports that had been extended since this policy was placed in effect, and randomly sampled 15 condition reports for a detailed review. The inspectors found that 11 of the 15 condition reports reviewed did not receive the proper approval per the new policy. The inspectors determined that the policy has not been effective since numerous condition report due dates were extended without following policy guidance. This was a performance deficiency because it is a failure to follow a self-imposed standard; however, it is not a violation of NRC requirements since the policy is not required by Dominion's operating license. The inspectors determined the issue was minor because even though the proper approvals were not received for the condition report due date extensions, Dominion had addressed each of the issues in a timely manner commensurate with the safety significance. Therefore, the inspectors determined the issue is not subject to enforcement action in accordance with the NRC's Enforcement Policy.

### Abnormal Operating Procedure (AOP) 2579B

The inspectors reviewed corrective actions in apparent cause evaluation (ACE) 014108, which were written to address an NCV from a 2008 NRC triennial fire protection inspection. The NRC issued this NCV for Dominion's failure to demonstrate they could restore auxiliary feedwater to a steam generator within 30 minutes following a fire consistent with the Unit 2 fire safe shutdown analysis. A corrective action from the ACE was assigned to revise AOP 2579B to support operator success in meeting the time critical operator action of 30 minutes. The inspectors found that this enhancement was closed inappropriately with no work performed. However, subsequent to the NCV having been issued, Dominion performed an evaluation of operator actions that showed the station could meet the 30 minute requirement to restore auxiliary feedwater. Therefore, the inspectors determined that this issue did not represent a more than minor performance deficiency because Dominion had performed an evaluation that proved the operators could meet the 30 minute requirement despite the AOP having not been revised.

### Unit 1 Emergency Preparedness Drill

The inspectors reviewed CR460177, which was written to document potential enhancements for emergency response following a December 2011 Unit 1 emergency preparedness training drill. The condition report was closed with no action taken on the enhancements. The condition report should have opened corrective actions to address each enhancement item. The inspectors determined this issue was minor because the items were enhancements and not required for adequate emergency response.

### Unit 3 Tritium Found in Electrical Manhole

The inspectors reviewed corrective actions CA208029 and CA208030, which were associated with tritium found in electrical manhole 3EMH-3A. The corrective actions required engineering to evaluate capturing condensation before tritiated water vapor is introduced into the environment, and present the results of the evaluation to the station's plant health committee. Both corrective actions had requested due date extensions but were then improperly closed before the work was done. The inspectors determined that this issue did not represent a more than minor performance deficiency because the corrective actions were enhancement items and previous corrective actions completed by Dominion had effectively addressed the tritium issue. Therefore, this issue is not subject to enforcement action in accordance with the NRC's Enforcement Policy.

Finally, the inspectors identified one example of more than minor significance where Dominion personnel failed to take prompt and effective corrective actions for a degraded trip latch mechanism on the Unit 3 turbine driven auxiliary feedwater pump turbine. This finding is documented in Section 4OA2.1.c.

#### c. Findings

##### (1) Failure to Take Timely Corrective Actions to Restore Degraded Unit 3 Main Feedwater Isolation Valves

Introduction. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criteria XVI, "Corrective Action," for Dominion's failure to take timely corrective actions for conditions adverse to quality involving the degradation of the closing capability of four Unit 3 main feedwater isolation valves. Dominion has deferred correcting this condition adverse to quality for over a period of six years (three refueling outages), and correction of the degraded condition is currently scheduled for the next refueling outage (April 2013).

Discussion. On June 27, 2007, Dominion identified that four Unit 3 main feedwater isolation valves, 3FWS\*CTV41A, B C, and D, would not positively close against main feedwater pump discharge pressure to isolate feedwater flow into containment in the event of a main feedwater line rupture. Further analysis concluded that the feedwater isolation would likely occur when the feedwater pumps were subsequently stopped by either a non-safety grade trip signal or manual operator action. The feedwater isolation valves are safety-related valves that comprise train "B" of the main feedwater isolation function as described in the Millstone Updated Final Safety Analysis Report (UFSAR). Dominion determined that the hydraulic actuators for these valves were inadequately sized based on operating experience as described in Electric Power Research Institute (EPRI) Technical Report TR-103232. The valves were initially scheduled to be restored to full qualification during refueling outage (RFO), 3RFO11, in October 2008, but the repairs were deferred to 3RFO12 due to maintenance schedule conflicts. Subsequently, repairs were not completed in either 3RFO12 or 3RFO13, and have been rescheduled to the upcoming refueling outage 3RFO14 in April of 2013, six years after the problem was first identified.

The main feedwater isolation valves are safety-related containment isolation valves that rapidly close in response to a phase "B" feedwater isolation emergency safeguards feature (ESF) signal. These valves are relied upon to ensure that the flow of hot

feedwater is rapidly isolated for a variety of analyzed events including the rupture of a feedwater header inside containment. If feedwater flow is not isolated to the break, the additional energy transported into containment may challenge containment pressure and temperature limits, as well as the equipment qualification of various instruments and equipment inside containment.

Dominion issued condition report CR483637 on August 1, 2012, and placed the motor-driven feedwater pump in pull-to-lock to prevent it from automatically starting if a drop in feed header pressure occurred from a feed header rupture. Dominion subsequently completed an immediate operability determination (IOD), which concluded that the feedwater isolation function was degraded but operable based upon the conclusion that the main feedwater pumps would likely trip within a short period of time. The non-safety grade main feedwater pump trip signal that would likely stop the pumps and operator actions would also manually stop the main feedwater pump while implementing emergency operating procedure E-0, "Reactor Trip or Safety Injection."

Analysis. The inspectors determined that the failure to take timely corrective action following identification of a degraded condition of the Unit 3 main feedwater isolation valves was a performance deficiency that was reasonably within Dominion's ability to foresee and prevent.

The inspectors determined this issue was more than minor because it is similar to the more than minor examples, 4.f and 4.g of NRC Inspection Manual Chapter (IMC) 0612, Appendix E, "Examples of Minor Issues." Specifically, a condition adverse to quality was not corrected in a timely manner and resulted in a situation that impacted the operability of the feedwater isolation valves. Additionally, the finding is more than minor because it is associated with the Design Control attribute of the Barrier Integrity cornerstone, and adversely affected the cornerstone's objective of providing reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events.

In accordance with NRC Inspection Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," a Phase 1 significance determination process (SDP) screening was performed and determined the finding was of very low safety significance (Green) because the issue did not represent an actual open pathway in the physical integrity of the reactor containment. In the event of a ruptured feedwater line, the train "A" main feedwater regulating valves and bypass valves would remain capable of closing to isolate feedwater flow.

The inspectors determined this finding had a cross-cutting aspect in the Human Performance cross-cutting area, Decision Making component, because Dominion did not use conservative assumptions in decision making when delaying the repairs [H.1(b)]. Specifically, Dominion's decision to defer repair of the main feedwater isolation valves was primarily based on the conclusions in OD00027, which determined the valves would be operable based on several non-conservative assumptions including an incorrect valve factor and not establishing compensatory actions to credit the main feedwater pump trip signal and manual time critical operator actions.

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and

equipment, and non-conformances are promptly identified and corrected. Contrary to the above, on June 27, 2007, Dominion did not take timely corrective actions to correct the degraded condition of the Unit 3 main feedwater isolation valves. Dominion has taken action to schedule the replacement of the main feedwater isolation valves in the next refueling outage (April 2013). Because this finding is of very low safety significance (Green) and has been entered into Dominion's corrective action program (CR483477), the NRC is treating this finding as an NCV, consistent with the NRC's Enforcement Policy. **(NCV 05000423/2012010-01, Failure to Take Timely Corrective Actions to Restore Degraded Unit 3 Main Feedwater Isolation Valves)**

(2) Failure to Take Prompt and Effective Corrective Actions to Address TDAFW Pump Trip Latch Mechanism Degradation

Introduction. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criteria XVI, "Corrective Action," for Dominion's failure to take prompt and effective corrective actions for conditions adverse to quality involving degradation of the TDAFW pump trip latch mechanism. Dominion did not identify the cause of the trip latch mechanism degradation until after multiple surveillance test failures had occurred. In response to questions from NRC inspectors, Dominion performed additional troubleshooting and determined that the linkage was not properly lubricated, and the linkage impact gap was out of adjustment.

Discussion. On November 17, 2011, the TDAFW pump turbine steam supply valve 3MSS\*MSV5 failed to trip when the mechanical trip lever was depressed during a quarterly operational surveillance test. Initial troubleshooting efforts indicated that the trip latch mechanism had paint residue on the latch surface, and that the paint had interfered with the operation of the trip mechanism. The trip latch surfaces were cleaned and the trip latch was retested satisfactorily. On March 26, 2012, 3MSS\*MSV5 again failed to trip when the mechanical trip lever was depressed during a quarterly operational surveillance test. Initial troubleshooting efforts indicated that rust particles had interfered with the operation of the trip mechanism. The trip latch surfaces were cleaned and the trip latch was retested satisfactorily. Finally on March 27, 2012, another surveillance test revealed that the mechanical latch again failed to trip. Additional troubleshooting did not reveal any additional causes of the failure, and the trip latch subsequently passed a surveillance test after it had been cleaned and exercised by maintenance. No condition report was written by Dominion for the failure on March 27. The TDAFW pump was subsequently declared operable on March 28, 2012.

On May 5, 2012, in response to questions from NRC inspectors, troubleshooting and testing conducted by Dominion revealed that the latching mechanism was excessively stiff. A pull test was conducted and the latching mechanism required 30 to 35 lbs to trip the latch. The vendor specification for the force required to trip the latch is less than 25 lbs force. Additional troubleshooting revealed that the linkage impact gap was out of proper adjustment. On May 8, 2012, Dominion lubricated and exercised the trip throttle linkage, reduced the force required to trip the latch to within specifications, and adjusted the impact gap to the proper dimensions. The trip latch was then retested satisfactorily.

The inspectors determined that Dominion did not perform adequate troubleshooting on the trip latch mechanism, such as verifying the linkage was within vendor specifications for trip force until May 8, 2012, a period of 42 days after the March 27, 2012 failure. Due

to the inadequate troubleshooting, the underlying problems with the trip latch mechanism were not identified and corrected.

Analysis. The inspectors determined that the failure to take prompt and effective corrective action following identification of a condition adverse to quality with the trip latch mechanism was a performance deficiency that was reasonably within Dominion's ability to foresee and prevent.

The inspectors determined that this issue was more than minor because it is similar to the more than minor example 4.f of IMC 0612, Appendix E, "Examples of Minor Issues." Specifically, Dominion failed to correct a condition adverse to quality that affected the operability of the TDAFW pump. Additionally, the finding was more than minor because it is associated with the Equipment Performance attribute of the Mitigating Systems cornerstone, and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, a condition adverse to quality with the trip latch mechanism was not properly evaluated, not effectively corrected, and resulted in a situation that impacted the reliability of the component.

In accordance with NRC Inspection Manual Chapter 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," a Phase 1 SDP screening was performed and determined the finding was of very low safety significance (Green) because the finding does not represent a loss of system and/or function, does not represent an actual loss of function of at least a single train for greater than its technical specification allowed outage time or two separate safety systems out-of-service for greater than its technical specification allowed outage time, and does not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's Maintenance Rule program for greater than 24 hrs.

The inspectors determined that this finding had a cross-cutting aspect in the Problem Identification and Resolution cross-cutting area, Corrective Action Program component, because Dominion did not thoroughly evaluate the problem such that the resolution addressed the causes [P.1(c)]. Specifically, Dominion's causal evaluation did not provide for prompt and effective resolution of the degraded trip latch.

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected. Contrary to the above, from November 17, 2011, to May 8, 2012, Dominion did not take prompt and effective corrective actions to identify and resolve the degraded condition of the TDAFW pump trip latch mechanism prior to the condition adversely impacting reliability of the component. Dominion prepared CR483676 to assess the cause and corrective actions for ACE 019090. Because of the very low safety significance (Green) and because it has been entered into Dominion's CAP (CR483676), the NRC is treating this finding as an NCV, consistent with the NRC's Enforcement Policy. **(NCV 05000423/2012010-02, Failure to Take Prompt and Effective Corrective Actions to Address TDAFW Pump Trip Latch Mechanism Degradation)**

## .2 Assessment of the Use of Operating Experience

### a. Inspection Scope

The inspectors reviewed a sample of condition reports associated with the review of industry operating experience to determine whether Dominion appropriately evaluated the operating experience information for applicability to Millstone Power Station and had taken appropriate actions, when warranted. The inspectors also reviewed evaluations of operating experience documents associated with a sample of NRC generic communications to ensure that Dominion adequately considered the underlying problems associated with the issues for resolution via their corrective action program. In addition, the inspectors observed various plant activities to determine if the station considered industry operating experience during the performance of routine and infrequently performed activities.

### b. Assessment

The inspectors determined that Dominion appropriately considered industry operating experience information for applicability, and used the information for corrective and preventive actions to identify and prevent similar issues when appropriate. The inspectors determined that operating experience was appropriately applied and lessons learned were communicated and incorporated into plant operations and procedures when applicable. The inspectors also observed that industry operating experience was routinely discussed and considered during the conduct of CRT meetings.

### c. Findings

No findings were identified.

## .3 Assessment of Self-Assessments and Audits

### a. Inspection Scope

The inspectors reviewed a sample of audits, including the most recent audit of the corrective action program, departmental self-assessments, and assessments performed by independent organizations. Inspectors performed these reviews to determine if Dominion entered problems identified through these assessments into the corrective action program, when appropriate, and whether Dominion initiated corrective actions to address identified deficiencies. The inspectors evaluated the effectiveness of the audits and assessments by comparing audit and assessment results against self-revealing and NRC-identified observations made during the inspection.

### b. Assessment

The inspectors concluded that self-assessments, audits, and other internal Dominion assessments were generally critical, thorough, and effective in identifying issues. The inspectors observed that Dominion personnel knowledgeable in the subject completed these audits and self-assessments in a methodical manner. Dominion completed these audits and self-assessments to a sufficient depth to identify issues which were then entered into the corrective action program for evaluation. In general, the station implemented corrective actions associated with the identified issues commensurate with



their safety significance. However, the inspectors identified one example of more than minor significance where Dominion personnel failed to perform procedurally required effectiveness reviews for numerous formal self assessments. This finding is documented in Section 4OA2.3.c.

c. Findings

Introduction. The inspectors identified a finding (FIN) of very low safety significance (Green) for Dominion's failure to perform procedurally required effectiveness reviews for numerous formal self-assessments. Consequently, Dominion missed opportunities to identify potential corrective actions for resolution in the corrective action program.

Description: The inspectors performed a review of Dominion self-assessments completed since the last PI&R inspection in February 2010. Dominion self-assessments include both formal and informal self-assessments. Formal self-assessments are performed to ensure the level of performance is equal to industry experience and best practices, and typically are conducted by a diverse, multimember team of site employees and industry peers. Informal self-assessments are short duration, rapid turnaround activities designed to review a program or process.

The inspectors performed a review of procedures that detail the requirements for formal self-assessments. Specifically, the inspectors reviewed Dominion procedure PI-AA-100-1004, "Self-Assessments," Revision 8. Step 3.5.2 of the procedure states that if a formal self-assessment is being performed, then an effectiveness review of the results of the assessment shall be created. The inspectors reviewed a list of approximately 230 formal and informal self-assessments, and sampled 14 formal self-assessments for a detailed inspection. The inspectors found that six formal self-assessments did not include the procedurally required effectiveness review. These formal self-assessments reports (SAR) were:

- SAR001048, "Procedure Use and Adherence"
- SAR001067, "VPP to Include Employee Involvement and Slips/Trips/Falls"
- SAR001473, "Processing of Protective Services"
- SAR001542, "Fleet Job-Hazard Control Assessment in Support of 2015 Business Plan"
- SAR001723, "Maintenance Outage Preparations"
- SAR001782, "2012 Millstone PI&R Inspection Readiness."

Team leaders from the departments of operations, safety, security, maintenance, and organizational effectiveness had failed to ensure that an effectiveness review was completed for the self-assessment they had led. Further inspection of the issue revealed that multiple programmatic barriers had failed to ensure that the effectiveness reviews would be completed. This included insufficient training of team leaders, a failure to perform planning checklists which assign the effectiveness review to the team leader, and a failure of the self-assessment program oversight to discover the missing effectiveness review during a final review of the self assessment. Due to the failure of numerous barriers in the program, the inspectors determined that this represented a programmatic weakness in the station's ability to ensure that formal self-assessments and their effectiveness reviews are completed in accordance with procedural requirements.

Analysis. The inspectors determined that Dominion's failure to consistently implement procedural requirements with respect to performing effectiveness reviews for formal self-assessments was a performance deficiency that was within Dominion's ability to foresee and correct and should have been prevented.

This finding is more than minor because it is similar to IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," example 3.j; in that, it represents a programmatic deficiency that could lead to worse errors if uncorrected. The inspectors determined it was a programmatic deficiency because multiple programmatic barriers had failed to ensure the effectiveness reviews would be completed. The inspectors determined that the issue could have the potential to lead to worse errors if left uncorrected because not following an established process for performing effectiveness reviews could lead to ineffective corrective actions that go undetected. This finding was evaluated in accordance with NRC IMC 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," and determined to be of very low safety significance (Green) because the finding does not represent a loss of system and/or function, does not represent an actual loss of function of at least a single train for greater than its technical specification allowed outage time or two separate safety systems out-of-service for greater than its technical specification allowed outage time, and does not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's Maintenance Rule program for greater than 24 hrs. The inspectors determined that this finding is not associated with an NRC Reactor Oversight Process cornerstone.

The inspectors determined that this finding had a cross-cutting aspect in the Human Performance cross-cutting area, Work Practices component, because Dominion personnel failed to follow procedures. [H.4(b)].

Enforcement. This finding does not involve enforcement action since no regulatory requirement violation was identified because Dominion procedure PI-AA-100-1004 is not required to be implemented as part of the Dominion's 10 CFR 50 Appendix B Quality Assurance Program. Dominion has entered the issue into the corrective action program (CR482135). Because this finding does not involve a violation, it is identified as a finding (FIN). **FIN 05000336&423/2012010-03, Failure to Perform Effectiveness Reviews for Formal Self-Assessments.**

#### .4 Assessment of Safety Conscious Work Environment

##### a. Inspection Scope

During interviews with station personnel, the inspectors assessed the safety conscious work environment at Millstone Power Station. Specifically, the inspectors interviewed personnel to determine whether they were hesitant to raise safety concerns to their management and/or the NRC. The inspectors also interviewed the station Employee Concerns Program coordinator to determine what actions are implemented to ensure employees were aware of the program and its availability with regards to raising safety concerns. The inspectors reviewed the Employee Concerns Program files to ensure that Dominion entered issues into the corrective action program, when appropriate.

b. Assessment

During interviews, Dominion staff expressed a willingness to use the corrective action program to identify plant issues and deficiencies and stated that they were willing to raise safety issues. The inspectors noted that no one interviewed stated that they personally experienced or were aware of a situation in which an individual had been retaliated against for raising a safety issue. All persons interviewed demonstrated an adequate knowledge of the corrective action program and the Employee Concerns Program. Based on these limited interviews, the inspectors concluded that there was no evidence of an unacceptable safety conscious work environment and no significant challenges to the free flow of information.

c. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On Thursday, August 2, 2012, the inspectors presented the inspection results to Mr. Stephen Scace, Site Vice President, and other members of the Millstone Power Station staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

ATTACHMENT: SUPPLEMENTARY INFORMATION

## **SUPPLEMENTARY INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee Personnel**

P. Anastas - Nuclear Engineer III ENGR - Nuclear Engineering Programs  
 D. Bajumpaa - Consulting Engineer - Nuclear Safety Analysis  
 D. Cleary - System Engineering Supervisor  
 J. (W.) Cote - Senior Instructor, Unit 3  
 G. D'auria - Nuclear Chemistry Supervisor  
 P. Dellarco - Coordinator Nuclear Procedures  
 T. Fecteau - Design Engineer  
 B. Ferguson - Shift Manger (Unit 2)  
 C. Flory - Nuclear Technical Specialist III  
 K. Grover - Manager Nuclear Operations  
 S. Hanerfeld - Corrective Action Program Manager  
 M. Hess - Nuclear Engineer III  
 S. Matthes - Nuclear Chemistry Supervisor  
 J. Paris - System Engineer  
 D. Regan - Radiation Protection Supervisor  
 L. Salyards - Licensing Specialist  
 J. Shaffer - Sr. Nuclear Chemistry Technician  
 D. Smith - Emergency Preparedness Manager  
 E. Smith - System Engineer  
 R. Smith - Procedures Group Manager  
 S. Smith - Manager, Nuclear Engineering  
 R. Steenbergen - Nuclear Engineer III  
 H. Williamson - Shift Manager (Unit 2)

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

#### **Opened and Closed**

05000423/2012010-01	NCV	Failure to Take Timely Corrective Actions to Restore Degraded Unit 3 Main Feedwater Isolation Valves
05000423/2012010-02	NCV	Failure to Take Prompt and Effective Corrective Actions to Address TDAFW Pump Trip Latch Mechanism Degradation
05000336&423/2012010-03	FIN	Failure to Perform Effectiveness Reviews for Formal Self-Assessments

## LIST OF DOCUMENTS REVIEWED

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

#### **Audits and Self-Assessments**

Nuclear Oversight Audit 12-02: Emergency Preparedness, April 20, 2012  
 SAR000934, Drill and Exercise Corrective Action Effectiveness  
 SAR000402, Operating Experience Program  
 SAR001071, Maintenance Rule Evaluation Assessment  
 SAR001235, ERO Activation Including On Shift Staffing and Staff Augmentation  
 SAR001422, Formal Self-Assessment of the Millstone Maintenance Rule Program  
 SAR001868, Assessment of Maintenance Rework  
 SAR001051, Human Performance in RP  
 SAR001048, Procedure Use and Adherence  
 SAR001425, Communications in RP  
 Nuclear Oversight Audit 10-01, Security/FFD/UAA  
 Nuclear Oversight Audit 12-01, FFD and UAA Audit Report  
 Nuclear Oversight Audit 11-05, Corrective Action and Independent Review  
 SAR001599, Millstone Power Station 2011 Mid-Cycle Assessment  
 SAR001048, Procedure Use and Adherence  
 SAR001067, VPP to Include Employee Involvement and Slips/Trips and Falls  
 SAR001473, Millstone Formal Self-Assessment on Processing of Protection Services  
 Information  
 SAR001517, Training Programs  
 SAR001542, Safety – Fleet Job Hazard  
 SAR001571, Simulator Fidelity  
 SAR001709, ISI Program  
 SAR001723, Maintenance Outage Preparations  
 SAR001782, Millstone PI&R Self Assessment  
 SAR001794, Assessment of the Implementation of the MPS Corrective Action Program  
 SAR001868, Maintenance Rework  
 ITC-SA-04-23, Operating Experience Program Self Assessment

#### **Condition Reports and Corrective Action Items** (\* indicates that condition report was generated as a result of this inspection)

08-00406	356077	374866	387035	397934
08-03194	363704	374912	387858	399101
07-07160	365613	374913	388630	400037
325532	365353	375566	388767	400167
333435	365613	375997	389364	401142
341621	365628	377624	393925	401995
342874	366382	380942	394563	403963
343031	370991	384221	394678	405337
354059	372053	386142	395026	406328
355434	372130	386654	396012	406661
355646	372131	386769	396251	412791

414195	121147	190775	228911	467115
415782	420485	190776	189913	467817
418746	217790	190777	200895	471758
425970	480749	190778	206034	472328
426589	379359	190779	210873	473596
426592	167826	190780	214971	476136
429521	186371	190781	209829	476206
429578	405407	467858	222336	477107
430366	186359	230563	224310	478020
431576	405419	230564	440547	478857
431831	460090	233769	449697	478888
433674	464209	235919	449680	479294
434032	228071	235920	449650	479373
435027	229850	235924	175765	479541
436518	229851	235921	189913	479760
436521	467115	367763	195438	480363
436675	230220	159654	200895	480766
437445	230222	367746	206034	481401
437907	127389	159654	209829	481694
441302	127390	367995	210873	481850
444344	127388	190782	214971	481939
444912	127391	190783	217744	482264
446342	127392	190784	222336	482274
455506	134673	190785	224310	482536
458424	332133	190786	225275	483477
460177	236892	420485	228911	483676
462222	134673	440547	229579	483938
463020	390239	464453	229863	483048
464019	476936	454945	229871	483315
465420	239689	452067	229875	483477
465969	480561	442926	110811	483637
468089	377802	368451	316335	483826
466825	376651	368524	324298	483315*
472422	165879	371414	355314	481975*
472476	169454	372066	363297	481939*
473329	169456	377068	367704	483592*
478889	169457	381656	403794	483572*
481466	169460	385154	407906	482264*
405103	342087	397152	409403	482548*
392490	389134	448098	419723	482184*
185980	208029	461896	437419	483477*
472328	208030	465645	445228	482115*
235230	208031	195438	447218	482264*
233510	400084	217744	453213	482184*
476136	397038	450150	457341	482135*
476206	000635	229875	459821	483401*
473596	000636	229863	463624	
188954	000637	229871	464209	
410348	000638	229579	464340	
194088	188623	175765	464939	
194090	190774	225275	467114	

### Drawings

25203-30024, Millstone Unit 2 Single Line Diagram 125VDC Emergency & 120VAC Vital Systems, Revision 32  
25203-26131 SH.3 - Millstone Nuclear Power Station - Unit 2 Appendix R Boundary & Component Diagram Service Water Waterford, CT

### Operating Experience

IN 2010-20, Turbine-Driven Auxiliary Feedwater Pump Repetitive Failures  
IN 97-78, Crediting of Operator Actions in Place of Automatic Actions and Modifications of Operator Actions, Including Response Times  
OPEX002906, IN 2011-04, Affecting Stress Corrosion Cracking in Stainless Steel Piping in Pressurized Water Reactors  
CR464453  
CR454945  
CA221002  
CR452067  
CA219002  
CR442926  
CR367259  
CA224822

### NCVs and Findings

05000336/2011004-01, Failure to Electrically Isolate a Unit 2 Dissimilar Metal Flanged Joint Leads to Forced Shutdown Due to Service Water Leak  
0500336/2011003-02, Untimely Corrective Action for Unit 2 Safety Related Inverters Leads to Repetitive Out of Calibration Results  
05000305/2008008(DRS), Post-fire Shutdown Procedures Failed to Ensure Time-Critical Operator Actions were Performed in an Expeditious Manner  
05000336/2010003, Unit 3 Charging Pump Overheating and Cavitation during RCS Loop Vacuum Fill  
0500336/2011003, Inadequate Corrective Action Results in Loss of Unit 2 Enclosure Building's Safety Function

### Procedures

C MP 715E, General Practices for Flanges and Threaded Fasteners, Revision 1-02  
CM-AA-DDC-301, Post Design Change Testing, Revision 2  
CM-AA-REA-1001, Request for Engineering Assistance, Revision 1  
DNES-AA-GN-1003, Design Effects and Considerations, Revision 10  
ER-AA-5004, Long Range Planning, Revision 2  
ER-AA-MRL-10, Maintenance Rule Program, Revision 4  
ER-AA-MRL-100, Implementing Maintenance Rule, Revision 5  
MP-24-ENG-FAP947, Non-Code Repairs in Safety Class 3 Piping, Revision 1-05  
OP 2346A, 'A' Emergency Diesel Generator, Revision 27-13  
OP-AA-102-1001, Development of Technical Basis to Support Operability Determinations, Revision 6  
PI-AA-100-1004, Self Assessments, Revision 8  
PI-AA-100-1007, Operating Experience Program, Revision 9

PI-AA-200, Corrective Action, Revision 19  
 PI-AA-200-2002, Effectiveness Reviews, Revision 4  
 PI-AA-300-3001, Root Cause Evaluation, Revision 3  
 PI-AA-300-3002, Apparent Cause Evaluation, Revision 4  
 PI-AA-300-3003, Common Cause Evaluation, Revision 0  
 PT 21415A, MP2 Inverters 1-4 Tests, Revision 4-04  
 SP 2613K, Diesel Generator Slow Start Operability Test, Facility 1, Revision 5  
 SP 2613L, Diesel Generator Slow Start Operability Test, Facility 2, Revision 5-02  
 OA8, Housekeeping of Station Buildings, Facilities, Equipment, and Grounds, Revision 007-04  
 AOP 2560, Millstone Unit 2 Storms, High Winds and High Tides, Revision 010-08  
 RP-AA-502, Ground Water Protection Program, Revision 4  
 CM-AA-TCA-101, Operator Time Critical Actions, Revision 0  
 C OP 200.18, Time Critical Action Validation and Verification, Revision 000-01  
 ER-AA-MRL-100, Implementing Maintenance Rule, Revision 5  
 PI-AA-100-1007, Operating Experience, Revision 9  
 DNAP-0110, Identifying and Addressing Nuclear Safety and Quality Concerns, Revision 2  
 RPM 2.4.3, DOP Testing of Portable HEPA Filtered Ventilation and Vacuum Units, Revision 005-01  
 CM-AA-TCA-101, Time Critical Operator Actions, Revision 0  
 C OP 200.18, Time Critical Action Validation and Verification, Revision 000-01  
 MP-05-DC-FAP01.1, Developing and Modifying Procedures, Revision 011-01  
 OP-AA-102-1001, Development of Technical Basis to Support Operability Determinations, Revision 6

#### Work Orders

53102399850, 53102300585, 53102428448, 53102428439, 53102439805, 53102266363,  
 53102389487, 53102446088, 53102457030, 53102468347, 53102468350, 53102468351,  
 53102468352, 53102512103, 53102512109, 53102513353

#### Miscellaneous

A1E000129, SENG – ASMT, perform an a(1) Evaluation for identified MP3 systems  
 DM2-00-0145-09, Installation of F3D/E/F Blower Cooling Inlet Air Filters and Air Discharge Piping Material Upgrades, 7/13/09  
 DM2-01-0145-09, Instrument Air Compressor Discharge Check Valve Flange Face Modification, 10/19/09  
 DM2-02-0145-09, F3D, F3E and F3F Discharge Air Piping Modification and Check Valve Model Number Change, 12/8/09  
 DM2-05-0145-09, F3D Discharge Air Piping Minor Configuration Change, 7/22/10  
 DM2-06-0145-09, F3D Check Valve 2-IA-975 Model Change, 10/19/10  
 DM2-S-0213-94, Vital Inverter Synchronizing Limit Set Point Change, 4/14/94  
 ENG-04349E2, MP Static Transfer Switches VS1, VS2, VS3, and VS4 Synchronizing Limit Setpoint, Revision 0  
 ETE-CEP-2012-1001 – Galvanic Corrosion Mitigation for Dissimilar Metal Joints in Sea Water Service, Revision 0  
 ETE-MP-2011-0104, MP2 Inverter Synchronization, Revision 0  
 Millstone Emergency Preparedness DSEM Meeting Summary, Monthly Meeting for 5/26/2012-6/25/2012  
 MP-10-026, Revision 40 to the Millstone Emergency Plan – Supplemental Review Covering Changes not Addressed in 50.54q MP-10-015



MP2-12-01027, 120VAC Vital Inverter Synchronizing Limit Setpoint Change, Revision 0  
 MP2 Vital Inverters, System 2345B, 2007 Quarterly System Health Reports  
 MP2 Vital Inverters, System 2345B, 2008 Quarterly System Health Reports  
 MP2 Vital Inverters, System 2345B, 2009 Quarterly System Health Reports  
 MP2 Vital Inverters, System 2345B, 2010 Quarterly System Health Reports  
 MP2 Vital Inverters, System 2345B, 2011 Quarterly System Health Reports  
 MP2 Vital Inverters, System 2345B, 2012 1<sup>st</sup> Quarter System Health Report  
 MRE012128, SENG MRE, 3MSS-P47A and 3MSS-P47C show evidence of thermal binding between plug and cage  
 MRE012940, Site Eng MRE, Security notification of water tight door between EDG rooms found open  
 MRE013911, SENG Unit 2 Reactor Trip  
 MRE01480, SENG MRE, EEQ qualification of Main Steam transmitters is in question  
 MRE014220, SENG – MRE, 2-SW-178C, SW to X183m upper SWGR room failed surveillance SP 2612D-002  
 MRE014159, SENG – SW spool leak required an unplanned shutdown IAW TSAS 3.7.4.1 and TRM 3.4.10  
 NEI 07-07, Ground Water Protection Program, August 2007  
 12-10-M, Nuclear Oversight Assessment - Time Critical Operator Actions, March 2012  
 ACE014108, AOP 2579B Validation does not support 30 min requirement for AFW initiation  
 MRE012051, Site Engr- 'B' CHS pp stopped after exhibiting indications of cavitation  
 ACE18173, "B" Charging Pump stopped after exhibiting indications of cavitation  
 RCE001037, Millstone Unit 2 Reactor Trip on 11/28/2010  
 MRE012949, Power Range B Bistable indication is inconsistent with other channels  
 ACE19015, Three SI valve found out of position  
 ACE 19151, Unit 3 "B" EDG Inability to Load to 110%  
 ACE018137, Worker entered a Locked High Radiation Area on the Incorrect RWP  
 ACE018276, Chemistry - Tritium in Water Found in Electrical Manhole 3EMH-3A (LTCA)  
 RCE001032, Free Available Chlorine NPDES Exceedance at Sample Point DSN001C-5  
 EFR000334, RCE 001032 OR/CA EFR - Unit 3 NPDES exceedance for Service Water  
 ACE19089, Unable to reset TDAFW governor speed setting to required 19.8-20 per SP 3622.3  
 MRE014949, SENG - MRE, Unable to reset TDAFW governor speed setting to required  
 ACE19094, Unable to reset TDAFW governor speed setting to required 19.8-20 per SP 3622.3  
 25203-SP-M2-SU-1046, Unit 2 Appendix R Compliance Report  
 DM2-00-0152-11, Compliance Report revision Due to LBDCR 11-M2-005  
 SO-09-007, Standing Order: RWP Briefing Expectations & Verification for HRA, LHRA, and VHRA entries  
 MP3-11-01143, Design Change: Addition of Domestic Water low Pressure Shutoff to Hypochlorite Pumps  
 Millstone CAP Workflow Extension Policy, Effective 04/02/2012  
 Millstone Power Station KPIs for CARB Review, April 2012  
 Corrective Action Program Trend Report, 1<sup>st</sup> Quarter 2012  
 ACE019090, TDAFW trip valve failed to trip (repeat)  
 ACE019185, 3HVC\*FN1B wiring error  
 RCE001075, Unit 3 Entered TS 3.0.3 for all main steam line pressure transmitters inoperable  
 OD000237 (MP3-014-07), "MP3 Feedwater isolation trip valves – 3FWS\*CTV41A, B, C and D," Revision 1 and Revision 2  
 OD MP3-014-07, "3FWS\*CTV41's Closing Capability Against Main Feedwater Shutoff Pressure is Non-Conforming to Current Industry Requirements," Dated August 21, 2007  
 Memo MP3-DE-96-467, "MP3-Feedwater Overpressurization, DCR M3-96060," dated June 13, 1996

MEMO-NSA-20120002, Millstone 3 Steam Generator Tube Rupture (SGTR) Margin to Overfill (MTO) Critical Operator Action Times, dated May 21, 2012  
Email from w. Loweth to R. Burnham dated March 6, 2008  
MP 3760DB, "SG FWIV – Hydraulic Fluid and N2 Levels," Revision 008-03  
MRE014537, SENG-MRE 3MSS\*MSV5 trip throttle valve, the valve did not trip  
MRE014540, SENG MRE U3 Turbine Driven AFW Pump Failed Manual Trip  
MRE014952, SENG-MRE 3MSS\*MSV5 would not trip when manual overspeed device was actuated  
Plant Health Issues List dated July 24, 2012  
AR09000291, Recommend setpoint, design and procedure changes for MSVB ventilation system, Dated February 23, 2009  
AR070003963, Hydraulic Control Units Design Thrust Capabilities, Dated March 10, 2011  
EPRI TR-103232, EPRI MOV Performance Prediction Program, Dated November 1994  
NRC IN 97-78, Crediting of Operator Actions in Place of Automatic Action and Modifications of Operator Actions, Including response Times  
NRC IN 2012-03, Design Vulnerability in Electric Power System  
NRC IN 2012-14, Containment Concrete Surface Condition Examination Frequency and Acceptance Criteria  
NRC Part 21 Report 2012-12-00, Rosemount Transmitters Certain Rosemount Model 1154 Series H Pressure Transmitters  
NRC Memo from John Hannon to Sunnil Weerakkody, Subject: Resolution of Questions Concerning Compliance with Section III.L.2 of Appendix R, Dated February 10, 2005  
RAS 000176, Justification for TCOA to Secure RCPs, dated April 4, 2011  
SAA013218, The M2H7BD Unit 2 'B' Emergency Diesel Generator became unresponsive during a maintenance run resulting in a delay of restoration in excess of 48 hours  
SA001038, Informal SA - Effectiveness of Design Change Process Failure Modes and Effects  
SA001314, Fleet Post Modification Testing Effectiveness  
SA001160, Flow Accelerated Corrosion Program Health Report Adequacy  
SA001581, Maintenance Procedure Quality  
SA010557, NON-SA Engineering Fleet Effectiveness Reviews – CM 39, Operator Time Critical Actions  
Nuclear Oversight Assessment No. 12-10-M, Time Critical Operator Actions, Dated March 14, 2012  
Nuclear Oversight Department Quarterly Report Millstone Power Station, Fourth Quarter 2011  
Fleet Initiative Effectiveness Review CM-39, Fleet Time Critical Operator Actions, dated March 22, 2012

**LIST OF ACRONYMS**

ACE	Apparent Cause Evaluation
ADAMS	Agency-wide Documents Access and Management System
AOP	Abnormal Operating Procedure
CA	Corrective Action
CAART	Corrective Action Assignment Review Team
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CR	Condition Report
CRT	Condition Report Review Team
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
EPRI	Electric Power Research Institute
ESF	Emergency Safeguards Feature
FIN	Finding
IMC	Inspection Manual Chapter
IOD	Immediate Operability Determination
LTCA	Long Term Corrective Action
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
OA	Other Activities
PARS	Publicly Available Records System
RCE	Root Cause Evaluation
RFO	Refueling Outage
SAR	Self Assessment Report
SDP	Significance Determination Process
SGTR	Steam Generator Tube Rupture
TCOA	Time Critical Operator Action
TDAFW	Turbine Driven Auxiliary Feedwater
UFSAR	Updated Final Safety Analysis Report