



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

September 2, 2016

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 05000336/2016009 AND  
05000423/2016009

Dear Mr. Heacock:

On June 30, 2016, the United States Nuclear Regulatory Commission (NRC) completed an inspection at the Millstone Power Station (Millstone), Units 2 and 3. The enclosed report documents the inspection results, which were discussed on June 30, 2016, with Mr. John Daugherty, Site Vice President, and other members of your staff. During that discussion your staff requested to provide additional information for consideration. In-office review of the additional information continued by the NRC, and a telephonic exit meeting was conducted on July 22, 2016, with Mr. John Daugherty 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 Resources (Dominion) was generally effective in identifying, evaluating, and resolving problems. Dominion personnel identified problems and entered them into the corrective action program at a low threshold. Dominion generally prioritized and evaluated issues commensurate with the safety significance of the problems and corrective actions. However, the inspectors concluded there is a weakness in Dominion's corrective action program in the effectiveness and timeliness of corrective actions for identified deficiencies. The inspectors noted that corrective actions to improve site-wide performance at Millstone were ongoing at the time of this inspection with an overall performance recovery plan. Based on the issues noted during the inspection, the NRC will closely monitor the implementation and effectiveness of these corrective actions.

Three NRC-identified findings of very low safety significance (Green) are documented in the enclosed inspection report. The inspectors determined that each of these findings also involved a violation of NRC requirements. However, because of the very low safety significance and because they were entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs), consistent with Section 2.3.2.a of the NRC Enforcement Policy. If you contest these NCVs, you should provide a response within 30 days of the date of

D. Heacock

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

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/**

Glenn T. Dentel, Chief  
Reactor Projects Branch 2  
Division of Reactor Projects

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

Enclosure: Inspection Report 05000336/2016009 and 05000423/2016009  
w/Attachment: Supplementary Information

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**/RA/**

Glenn T. Dentel, Chief  
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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.: 05000336/2016009 and 05000423/2016009

Licensee: Dominion Nuclear Connecticut, Inc. (Dominion)

Facility: Millstone Power Station, Units 2 and 3

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

Dates: June 13, 2016, through June 30, 2016  
Additional In-Office Review July 1, 2016, through July 22, 2016

Team Leader: S. Rutenkroger, Ph.D., Senior Resident Inspector

Inspectors: S. Horvitz, Project Engineer  
L. McKown, Resident Inspector  
G. Newman, Resident Inspector

Approved by: Glenn T. Dentel, Chief  
Reactor Projects Branch 2  
Division of Reactor Projects

## SUMMARY

IR 05000336/2016009 and 05000423/2016009; 06/13/2016 – 07/22/2016; Millstone Power Station Units 2 and 3; Biennial Baseline Inspection of Problem Identification and Resolution. The inspectors identified three findings in the area of Effectiveness of Corrective Actions.

This NRC team inspection was performed by one regional inspector and three resident inspectors. The inspectors identified three findings of very low safety significance (Green) during this inspection and classified these findings as non-cited violations (NCVs). The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within Cross-Cutting Areas," dated December 4, 2014. All violations of U.S. Nuclear Regulatory Commission (NRC) requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6, dated July 2016.

### Problem Identification and Resolution

The inspectors concluded that Dominion was generally effective in identifying, evaluating, and resolving problems. Dominion personnel identified problems, entered them into the corrective action program at a low threshold, and generally prioritized and evaluated issues commensurate with their safety significance. Dominion appropriately screened issues for operability and reportability, and in most cases performed causal analyses that appropriately considered extent of condition, generic issues, and previous occurrences. However, the inspectors concluded there is a weakness in Dominion's corrective action program in the effectiveness and timeliness of corrective actions for identified deficiencies. The inspectors identified three violations for failures to implement corrective actions of which two violations involved a failure to restore compliance for degraded conditions previously documented by the NRC. Additional examples of findings and violations, due to Dominion failing to resolve degraded conditions, have been documented by the NRC in the biennial period. The inspectors noted that corrective actions to improve site-wide performance at Millstone were ongoing at the time of this inspection with an overall performance recovery plan.

The inspectors concluded that Dominion appropriately identified, reviewed, and applied relevant industry operating experience to Millstone's operations. In addition, based on those items selected for review, the inspectors determined that Dominion's self-assessments and audits were generally critical, thorough, and effective in identifying issues.

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: Barrier Integrity**

- Green. The inspectors identified a finding of very low safety significance involving a NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for Dominion's failure to promptly correct a condition adverse to quality. Specifically, Dominion did not take timely action to

address a previously identified issue in which Millstone Unit 3 procedures did not adequately address mitigation and classification of a loss-of-coolant accident (LOCA) with a concurrent loss of containment caused by a recirculation spray system (RSS) heat exchanger tube rupture. In response, Dominion revised a procedure to provide the steps to respond to the event as described in the final safety analysis report (FSAR) and promulgated a briefing sheet to operators to ensure awareness of the issue and new procedure steps. Dominion entered the issue into the corrective action program as condition report CR1041881.

This finding is more than minor because it represented a challenge to the procedure quality attribute of the Barrier Integrity cornerstone to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. The lack of procedural direction to mitigate an RSS heat exchanger tube rupture during a LOCA could result in challenging the integrity of the containment barrier. In accordance with IMC 0609, "Significance Determination Process," Attachment 4, "Initial Characterization of Findings," and IMC 0609, Appendix A, Exhibit 3, "Barrier integrity Screening Questions," Section B, "Reactor Containment," the finding screened to be of very low safety significance (Green), because the deficiency did not represent an actual open pathway in the physical integrity of reactor containment (valves, airlocks, etc.), containment isolation system (logic and instrumentation), and heat removal components. The inspectors determined that this finding has a cross-cutting aspect in the area of Human Performance, Conservative Bias, because Dominion staff considered a needed procedural revision to be lower priority based on confidence in the ability of operators to recognize, diagnose, and implement required actions given the event, rather than exhibiting a conservative bias to ensure the procedure provided a barrier to adverse consequences. [H.14] (Section 4OA2.1.c.(1))

### **Cornerstone: Mitigating Systems**

- Green. The inspectors identified a finding of very low safety significance involving a NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for Dominion's failure to correct conditions adverse to quality. Specifically, since 1985 Dominion has not corrected persistent leakage of borated water through the bottom head flanges of the Millstone Unit 3 RHS heat exchangers that is causing accumulating deposits of boric acid including discolored brown and black crystalized and liquid boric acid wastage. Dominion has scheduled repair of the 'A' RHS heat exchanger for refuel outage 3R18 in 2017 and 'B' for 3R19 in 2019. Dominion entered the issue into the corrective action program as condition report CR1041881.

This finding is more than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," because if left uncorrected, this performance deficiency has the potential to lead to a more significant safety concern based upon Dominion's failure to correct persistent boric acid leakage with evidence of rust formation and failure to identify the source of the rust and/or bound total lifetime material loss and corrosion of internal components to ensure operability. Specifically, if left uncorrected the availability, reliability, and capability of both trains of RHS has potential to be adversely impacted due to the potential for failure of internal heat exchanger components causing a loss of integrity, internal blockage, or interfacing and/or external loss of coolant. In accordance with Inspection Manual Chapter 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), because the finding did not represent an actual failure of a system, function, or

train of equipment and did not involve equipment specifically designed to mitigate a seismic, flooding, or severe weather initiating event (e.g., seismic snubbers, flooding barriers, tornado doors). The inspectors determined that this finding has a cross-cutting aspect in the area of Human Performance, Work Management, because the organization failed to implement the process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. Specifically, Dominion continued to defer and reschedule corrective action for repair of the flange connections. (H.5) (Section 4OA2.1.c.(2))

- Green. The inspectors identified a finding of very low safety significance involving a NCV of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action,” for Dominion’s failure to take corrective actions to preclude repetition of a significant condition adverse to quality. On February 26, 2014, Millstone Unit 2 station battery ‘201B,’ cell 27, failed, which was screened as a significant condition adverse to quality in accordance with Dominion’s procedures. Dominion evaluated the issue and identified three potential causes but did not institute corrective actions to preclude repetition. Dominion entered the issue into the corrective action program as condition report CR1041881.

This finding is more than minor in accordance with IMC 0612, “Power Reactor Inspection Reports,” Appendix B, “Issue Screening,” because it was associated with the equipment performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, absent corrective actions to preclude repetition of the cause of the failure of battery ‘201B,’ cell 27, the objective to ensure the reliability of safety related direct current (dc) battery systems was adversely affected. The inspectors also observed conditions which were consistent with precursors to the potential failure modes identified by Dominion that were not previously entered into a tracking database or the corrective action program. In accordance with Inspection Manual Chapter 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), because the finding did not represent an actual failure of a system, function, or train of equipment and did not involve equipment specifically designed to mitigate a seismic, flooding, or severe weather initiating event (e.g., seismic snubbers, flooding barriers, tornado doors). The inspectors determined that this finding has a cross-cutting aspect in the area of Human Performance, Challenging the Unknown, because Dominion identified three potential causes and when faced with an uncertain condition decided to not take corrective action to preclude repetition. (H.11) (Section 4OA2.1.c.(3))

## 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. 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's 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 Plan-of-the-Day, Condition Review Team, Corrective Action Assignment Review Team, and Corrective Action Review Board (CARB) meetings. The inspectors selected items from the following functional areas for review: engineering, operations, maintenance, emergency preparedness, radiation protection, chemistry, physical security, and oversight programs.

##### (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 on site, such as emergency diesel generators and safety injection systems. 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 July 2014. 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 NRC 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 for issues related to the Unit 2 spent fuel pools and station batteries, and the Unit 3 RHS heat exchangers.

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 initiated approximately 22,000 condition reports between June 2014 and May 2016. The inspectors observed supervisors at the Plan-of-the-Day, Condition Review Team, Corrective Action Assignment Review Team, and CARB 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. In general, inspectors did not identify any issues or concerns that had not been appropriately entered into the corrective action program for evaluation and resolution. In response to several questions and minor equipment observations identified by the inspectors during plant walkdowns, Dominion personnel promptly initiated condition reports and/or took immediate action to address the issues.

(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 was sufficient to ensure consistency in the categorization of issues. Operability and reportability determinations were performed when conditions warranted, and the evaluations generally supported the conclusions. Causal analyses appropriately considered the extent of condition or problem, generic issues, and previous occurrences of the issue. However, the inspectors identified some deficiencies in Dominion's prioritization and evaluation of issues in which Dominion did not implement a rigorous evaluation process to completion.

- (a) Troubleshooting Procedure Not Entered. The inspectors identified that on November 8, 2015, Dominion did not enter procedure MA-AA-103, "Conduct of Troubleshooting," to determine the failure mechanism of the 'C' reactor coolant pump oil leak in the lower oil reservoir that caused an unplanned downpower. Dominion failed to evaluate the cause prior to restarting Unit 2. The inspectors noted that this example of a lack of rigor in deciding when to enter the troubleshooting process followed a previously identified NRC NCV (NCV 05000423/2014013-01, Failure to Resolve Anomalous Data During Complex Troubleshooting of the Turbine Driven Auxiliary Feedwater Pump Controls, (ML15015A078)) for Dominion's failure to follow the troubleshooting procedure and a previously identified NRC NCV (NCV 05000423/2014005-03, Failure to Correct Multiple 'A' HVK Start and Runtime Failures, (ML15042A160)) for which the apparent cause (ACE019884) was determined by Dominion to be a failure of the organization to focus on timely and effective implementation of the troubleshooting process. 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, based on the information gathered during this inspection, the inspectors concluded that even if Dominion had properly entered procedure MA-AA-103 the failure mechanism would not reasonably have been determined at that time. Dominion documented this issue in condition report CR1046210.
- (b) Incomplete Evaluation of Nonconforming Relay. The inspectors determined that NRC Information Notice (IN) 16-01, Recent Issues Related to the Commercial Grade Dedication of Allen Bradley 700-RTC Relays," was not adequately evaluated for applicability and impact to Millstone in accordance with PI-AA-100-1007, "Operating Experience Program." Dominion concluded that the evaluation performed for condition report CR578817 based on Part 21 Report 2015-26-00, "Potentially Unqualified Component in Certain Allen Bradley Model 700RTC Timing Relays," was sufficient to address IN 16-01. However, Dominion was not able to identify complete documentation of this evaluation. In CR578817, Dominion documented that no new failure modes were introduced by the nonconforming relay based on external sources of electromagnetic interference and radiofrequency interference. However, Dominion did not consider sources internal to the enclosure as discussed in IN 16-01. The inspectors independently screened this issue in accordance with IMC 0612, Appendix B, and IMC 0612, Appendix E, and determined that this issue was of minor significance and, therefore, is not subject to enforcement action in accordance with the NRC's Enforcement Policy. Specifically, the inspectors noted that the affected component did not exhibit signs of abnormal operation, did not appear to be exposed to internal electromagnetic interference at levels of concern, and was promptly replaced. Dominion documented this issue in condition report CR1046210.

(c) Inadequate Evaluation of Wind Speed Criterion in Abnormal Operating Procedure Relative to Offsite Transmission Line Towers' Structural Design Criterion.

In condition report CR568999, Dominion documented a difference between the 90 mph wind speed at which Units 2 and 3 take actions in accordance with the station's abnormal operating procedures (AOP) and the 80 mph wind speed structural design criterion for offsite transmission line towers required by codes and standards contemporary with the construction of the towers. Dominion did not identify a basis for beginning to take AOP actions for an imminent loss of offsite power at 90 mph and closed condition report CR568999 with no further evaluation. The inspectors identified a potential concern in that Dominion did not evaluate the apparent discrepancy between the 80 mph required by code and the procedural actions starting at 90 mph. Dominion obtained the original design documentation for the towers and confirmed that the transmission line towers were constructed to a wind speed structural design criterion of 90 mph. 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 of minor significance and, therefore, is not subject to enforcement action in accordance with the NRC's Enforcement Policy. Specifically, although Dominion's evaluation accepted the 90 mph criterion without an identified basis, the criterion was confirmed to correspond with the actual design of the transmission line towers and did not require an in-depth evaluation to reach this conclusion. Dominion documented this issue in condition report CR1041832.

Additionally, over the two year period reviewed by the inspection team, there were findings identified by the NRC that can be attributed, in part, to less than adequate evaluation of issues.

(d) Change of Pump Reference Values Contrary to American Society of Mechanical Engineers Operation and Maintenance Code of Record. (NCV 2015003-01).  
Inspection Report (IR) 05000336/2015003, 05000423/2015003, (ML15316A261).

(e) Inadequate Procedural Direction to Mitigate a LOCA and Failure of an RSS Heat Exchanger Tube. (NCV 2015003-02). IR 05000336/2015003, 05000423/2015003, (ML15316A261).

(f) Failure to Identify and Promptly Correct a Condition Adverse to Quality. (NOV 2014008-02). IR 05000423/2014008, (ML14240A051).

(g) Failure to Adequately Maintain Emergency Action Levels (EALs). (NCV 2014003-02). IR 05000336/2014003, 05000423/2014003, (ML14224A098).

(h) Security Inspection Finding. (VIO 2014403-01).  
IR 05000336/2014403, 05000423/2014403, (ML14175A464).

(3) Effectiveness of Corrective Actions

Based on the samples reviewed, the inspectors determined that there is a weakness in Dominion's corrective action program in the effectiveness and timeliness of corrective actions for identified deficiencies. Of note, the inspectors identified issues with Dominion's corrective actions to address NRC non-cited violations and findings issued

since the last biennial problem identification and resolution inspection. The inspectors identified two violations (Sections 40A2.1.c.(1) and 40A2.1.c(2)) for Dominion's continuing failure to restore compliance for these previously documented violations. The inspectors also identified one violation for Dominion's failure to implement corrective actions to prevent recurrence of a significant condition adverse to quality (Section 40A2.1.c.(3)). Additionally, over the two year period of review the NRC identified findings that can be attributed, in part, to less than adequate effectiveness of corrective actions. Specifically:

- (a) Failure to Review Additional Failures Against the Supplementary Leak Collection and Release System (a)(1) Monitoring Plan. (NCV 2014005-01). IR 05000336/2014005, 05000423/2014005, (ML15042A160).
- (b) Failure to Correct Multiple 'A' Control Building Chilled Water System Start and Runtime Failures. (NCV 2014005-03). IR 05000336/2014005, 05000423/2014005, (ML15042A160).
- (c) Failure to Implement Standing Order Restrictions into the Emergency Operating Procedures (EOPs) and AOPs for the Unit 3 TDAFW Pump Flow Control Valves. (NCV 2014005-05). IR 05000336/2014005, 05000423/2014005, (ML15042A160).
- (d) Failure to Replace Defective Fuses in the 'A' Emergency Diesel Generator Resulting in Generator Failure. (NCV 2015001-02). IR 05000336/2015001, 05000423/2015001, (ML15132A300).
- (e) Repetitive Failures to Correct Unit 3 TDAFW Pump Performance Issues. (VIO 2016001-01). IR 05000336/2016001, 05000423/2016001, (ML16125A122).

The inspectors noted that corrective actions to improve site-wide performance at Millstone were ongoing at the time of this inspection with an overall performance recovery plan.

c. Findings

- (1) Failure to Promptly Correct Inadequate Procedural Direction for Responding to a LOCA with Failure of an RSS Heat Exchanger Tube

Introduction. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for Dominion's failure to promptly correct a condition adverse to quality. Specifically, Dominion did not take timely action to address a previously identified issue in which Millstone Unit 3 procedures did not adequately address mitigation and classification of a loss-of-coolant accident (LOCA) with a concurrent loss of containment caused by a recirculation spray system (RSS) heat exchanger tube rupture.

Description. The NRC documented NCV 05000423/2015003-02, "Inadequate Procedural Direction to Mitigate a LOCA and Failure of an RSS Heat Exchanger Tube," in the third quarter 2015 integrated inspection report, IR 05000336/2015003, 05000423/2015003, (ML15316A261). The NRC documented in the report that from July 1, 2015, to present, Dominion did not establish, implement, or maintain adequate written procedures for combatting LOCAs and loss of containment integrity. The third quarter

inspection results were presented to Dominion on October 14, 2015, and the inspection report was issued on November 10, 2015. In addition, Dominion entered this condition into the corrective action program on August 31, 2015, in CR1008205.

The NCV documented that given a LOCA with concurrent loss of containment caused by an RSS heat exchanger tube rupture, Dominion did not provide adequate procedural direction to ensure that a release would be promptly terminated and that long term core and containment cooling functions would be maintained. Furthermore, Dominion did not train their operators to respond to the failure of an RSS heat exchanger tube. There were no simulator training scenarios or classroom training plans for licensed operators that would prepare the operators to take effective mitigating actions, determine the emergency classification of this potential event, and formulate effective protective action recommendations.

In response, Dominion completed an apparent cause evaluation within a second condition report, CR1015787, issued on October 27, 2015. The apparent cause evaluation was approved with comments by CARB on December 3, 2015. The comments included that compensatory actions pending completion of the required revision needed to be defined and in place. The apparent cause evaluation was finalized on December 9, 2015, with the CARB comments incorporated by stating that a review of potential compensatory/interim measures was performed and none were determined to be necessary at the time. A corrective action was assigned to develop and incorporate steps into existing procedures to ensure consistent operator response to a Unit 3 RSS heat exchanger tube leak with an initial due date in February of 2016. Subsequently, Dominion approved an extension to the corrective action due date to August 1, 2016. The extension was based on other station priorities (station recovery plan, procedure upgrades) resulting in an impact on Dominion's ability to provide standard classroom and simulator changes on the procedure revision.

The inspectors noted that PI-AA-200, "Corrective Action," states that corrective action due dates shall be based on threat and vulnerability, the opportunity to implement the action, and the resources required. For example, PI-AA-200 includes a corrective action prioritization flow chart which directs that all criteria be evaluated before coming to a final priority decision. One criterion is "Organizational and Programmatic," which first asks whether the action corrects a deficiency that directly affects regulatory compliance. When so, the corrective action priority is "high," and the due date is typically no greater than 90 days. Finally, PI-AA-200 directs that extension requests consider the specific consequence/risk of not completing the corrective action, the mitigating actions now in place or otherwise already completed, and any additional vulnerabilities specific to not completing the corrective action. Dominion's documented approval of the extension request was that no risk existed and the procedure currently had generic guidance for the shift manager to confer with technical support center staff to remove the affected heat exchanger.

The inspectors concluded that the corrective action prioritization of "medium," with an associated due date typically not greater than 120 days, to revise the procedure was incorrect since that assigned priority only considered the first criterion in the flow chart ("Corrective Action Program"). The inspectors also concluded that the corrective action due date extension based on a risk assessment that concluded no risk existed was incorrect. Finally, the inspectors concluded that the corrective action due date extension based on the mitigating action that existing procedural steps were sufficient to mitigate

the risk was incorrect because those existing steps were previously identified by the NRC as being inadequate and a violation of Millstone Unit 3, TS 4.8.1. Although the inspectors considered Dominion's planned corrective action to incorporate the procedure revision into future training scenarios in order to validate and enhance operator response to be appropriate, the inspectors concluded that Dominion's decision to tie the needed procedural revision to training and simulator time was not warranted and did not properly consider the risk associated with the identified concern. Specifically, operators could not successfully respond to an event as described in the FSAR by following station procedures as written.

After the inspectors identified the concern, Dominion revised procedure AOP 3573, "Radiation Monitor Alarm Response," on June 22, 2016, to provide the steps to respond to the event as described in the FSAR and promulgated a briefing sheet to operators to ensure awareness of the issue and new procedure steps. Dominion entered the issue into the corrective action program in condition report CR1041881.

Analysis. The failure to promptly correct the lack of adequate procedural direction to mitigate and classify a LOCA with a concurrent loss of containment caused by an RSS heat exchanger tube rupture was a performance deficiency. This finding is more than minor because it represented a challenge to the procedure quality attribute of the Barrier Integrity cornerstone to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. The lack of procedural direction to mitigate an RSS heat exchanger tube rupture during a LOCA could result in challenging the integrity of the containment barrier.

In accordance with IMC 0609, "Significance Determination Process," Attachment 4, "Initial Characterization of Findings," and IMC 0609, Appendix A, Exhibit 3, "Barrier integrity Screening Questions," Section B, "Reactor Containment," the finding screened to be of very low safety significance (Green), because the deficiency did not represent an actual open pathway in the physical integrity of reactor containment (valves, airlocks, etc.), containment isolation system (logic and instrumentation), and heat removal components.

The inspectors determined that this finding has a cross-cutting aspect in the area of Human Performance, Conservative Bias, because Dominion staff considered a needed procedural revision to be lower priority based on confidence in the ability of operators to recognize, diagnose, and implement required actions given the event, rather than exhibiting a conservative bias to ensure the procedure provided a barrier to adverse consequences. [H.14]

Enforcement. 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that conditions adverse to quality, such as deficiencies are promptly identified and corrected. Contrary to the above, until June 22, 2016, Dominion did not promptly correct the deficiency that existed from July 1, 2015, in that Dominion did not establish, implement, or maintain adequate written emergency procedures. Specifically, Dominion did not correct in a timely manner the deficiency with emergency procedures which did not provide adequate procedural direction to mitigate and classify a LOCA with a concurrent loss of containment caused by an RSS heat exchanger tube rupture that was first entered into the corrective action program on August 31, 2015. Dominion's corrective actions to restore compliance included issuing a revision of procedure AOP 3573 on June 22, 2016, that provided

steps to the operators to properly respond to the event as described in the FSAR. Because this issue is of very low safety significance (Green) and Dominion entered this issue into their corrective action program (CR1041881), this finding is being treated as an NCV consistent with Section 2.3.2.a of the NRC Enforcement Policy. (NCV 05000423/2016002-01, Failure to Promptly Correct Inadequate Procedural Direction for Responding to a LOCA with Failure of an RSS Heat Exchanger Tube.)

(2) Failure to Implement Corrective Actions for Chronic Leakage at RHS Heat Exchanger Bottom Head Flanges

Introduction. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for Dominion's failure to correct conditions adverse to quality. Specifically, since 1985 Dominion has not corrected persistent leakage of borated water through the bottom head flanges of the Millstone Unit 3 RHS heat exchangers that is causing accumulating deposits of boric acid including discolored brown and black crystalized and liquid boric acid wastage.

Description. The purpose of RHS is to support Millstone Unit 3 cool down and provide the low pressure safety injection ECCS source from the refueling water storage tank. When supporting cool down, the system is placed into service at reactor coolant temperatures and pressures at or below 350 degrees Fahrenheit and 375 pounds per square inch gauge. The RHS heat exchangers are vertically oriented U-tube heat exchangers located outside of containment in the Engineered Safety Features building. The bottom head flange is a series of two mating interfaces surrounded by carbon steel bolting. The first mating interface is carbon steel to carbon steel between the upper shell material and the tube sheet, sealing in the reactor plant component cooling water on the heat exchanger shell side. The second mating interface is stainless steel to stainless steel between the tube sheet and the bottom head bowl, sealing in the borated reactor coolant system inventory on the tube side. A divider plate separates the inlet and outlet regions of the bottom head.

On September 23, 1985, a condition adverse to quality was first identified associated with boric acid leakage at the bottom head flange connections on both of the Millstone Unit 3 RHS heat exchangers. Initial plans to repair the leaking gaskets were cancelled in favor of inspection of the joint for leakage. Persistent leakage of borated water, ranging from drops per minute to a steady stream, continued from 1985 through the present time. The impact of the boric acid leakage on the heat exchanger bolts was evaluated periodically between 1996 and 2014 through removal and evaluation of a subset of the bolts. In each of these cases, minor general corrosion was identified, but boric acid wastage at the sample locations was not identified.

The inspectors reviewed 35 condition reports that were generated since the year 2000 that documented discolored boric acid leakage and residue at the RHS heat exchanger flanges. The inspectors also noted that since 2001, discolored brown and black crystalized and liquid boric acid wastage has been observed at the heat exchangers indicating lost material without associated boric acid degradation of the flange bolting. Dominion has not determined the source of the corrosion products.

In August 2008, Dominion created work orders to repair the leaking heat exchanger flanges during the Fall of 2008 refueling outage. However, Dominion did not perform this repair. In a subsequent 2009 condition report, Dominion documented that "[t]he

most important corrosion issue with this leakage is not the bolting which is being managed by the removal and inspections but the corrosion damage to the outer diameter of tube sheet and shell flanges which are carbon steel.” The inspectors determined that damage to the outer diameter of the tube sheet and shell flanges can create the potential for failure of internal heat exchanger components causing a loss of integrity, internal blockage, or interfacing and/or external loss of coolant. Dominion closed the 2009 condition report without further evaluation of the degraded condition, citing future repair under work orders generated in 2008 that were scheduled for the next refueling outage.

The inspectors noted that despite multiple tracking systems capturing the issue, including the corrective action program, boric acid program health reports, engineering technical evaluations, equipment reliability issues lists, and plant health issues lists, Dominion has failed to correct conditions adverse to quality associated with persistent boric acid leakage at bottom head flanges of both Unit 3 RHS heat exchangers in a timely manner. The NRC documented a minor violation for failing to correct this issue in 2015 in IR 05000336/2015002, 05000423/2015002, (ML15222A834). At that time, the NRC determined the condition did not have the potential to lead to a more significant safety concern provided the issue was monitored and restored in accordance with Dominion’s analysis, programs and work control plans. At that time, Dominion scheduled the repair of the ‘B’ RHS heat exchanger for the 2016 refueling outage and the ‘A’ heat exchanger for the 2017 refueling outage.

However, during this inspection the inspectors determined that Dominion continued to defer repair of the heat exchangers to the next refueling outage and did not repair the ‘B’ RHS heat exchanger in 2016 as was planned when the 2015 minor violation was identified. In addition, Dominion did not take any additional actions to determine the source(s) of rust, bound the total loss of metal from 1985 to the present day, evaluate and forecast potential future impact due to corrosion given continued deferral, or establish a clear plan of repair with high confidence of execution at the next available opportunity (i.e. next refueling outage). Therefore, this issue was not monitored and restored in accordance with Dominion’s analysis, programs, and work control plans.

Dominion has currently scheduled repair of the ‘A’ RHS heat exchanger for the 2017 refueling outage and the ‘B’ RHS heat exchanger for the 2019 refueling outage. Dominion entered this issue into the corrective action program as condition report CR1041881.

Analysis. The inspectors determined that Dominion’s failure to correct conditions adverse to quality associated with the Millstone Unit 3 RHS heat exchangers in a timely manner was a performance deficiency. Specifically, since 1985 Dominion has not corrected persistent leakage of borated water through the bottom head flanges of the Millstone Unit 3 RHS heat exchangers that is causing accumulating deposits of boric acid including discolored brown and black crystalized and liquid boric acid wastage. This finding is more than minor in accordance with IMC 0612, “Power Reactor Inspection Reports,” Appendix B, “Issue Screening,” because if left uncorrected, this performance deficiency has the potential to lead to a more significant safety concern based upon Dominion’s failure to correct persistent boric acid leakage with evidence of rust formation and failure to identify the source of the rust and/or bound total lifetime material loss and corrosion of internal components to ensure operability. Specifically, if left uncorrected the availability, reliability, and capability of both trains of RHS has potential to be



adversely impacted due to the potential for failure of internal heat exchanger components causing a loss of integrity, internal blockage, or interfacing and/or external loss of coolant.

In accordance with Inspection Manual Chapter 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), because the finding did not represent an actual failure of a system, function, or train of equipment and did not involve equipment specifically designed to mitigate a seismic, flooding, or severe weather initiating event (e.g., seismic snubbers, flooding barriers, tornado doors).

The inspectors determined that this finding has a cross-cutting aspect in the area of Human Performance, Work Management, because the organization failed to implement the process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. Specifically, Dominion continued to defer and reschedule corrective action for repair of the flange connections. [H.5]

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," states, in part, "Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected." Contrary to the above, from September 23, 1985, to the present day, Dominion failed to establish measures to assure that persistent leakage of boric acid through the carbon steel bottom head flanges of the Millstone Unit 3 RHS heat exchangers that is causing accumulating deposits of boric acid including discolored brown and black crystallized and liquid boric acid wastage was promptly corrected. Dominion established corrective actions to repair the leaks in refueling outages in 2017 and 2019. Because this issue is of very low safety significance (Green) and Dominion entered this issue into their corrective action program (CR1041881), this finding is being treated as an NCV consistent with the NRC Enforcement Policy Section 2.3.2.a. (NCV 05000423/2016009-02, Failure to Implement Corrective Actions for Chronic Leakage at Residual Heat Removal Heat Exchanger Bottom Head Flanges)

(3) Failure to Take Corrective Action to Preclude Repetition of the Condition that Caused Premature Failure of a Battery Cell

Introduction. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for Dominion's failure to take corrective actions to preclude repetition of a significant condition adverse to quality. On February 26, 2014, Millstone Unit 2 station battery '201B,' cell 27, failed, which was screened as a significant condition adverse to quality in accordance with Dominion's procedures. Dominion evaluated the issue and identified three potential causes but did not institute corrective actions to preclude repetition.

Discussion. On February 26, 2014, at 1040, following unsatisfactory low individual cell voltage surveillance test results for Millstone Unit 2 battery '201B,' cell 27, Dominion declared the battery inoperable and entered the action statement for TS 3.8.2.3 (which requires both 125 volts direct current (VDC) buses to be operable). The action statement requires, that with one bus inoperable, the inoperable bus will be restored

operable within two hours, otherwise Unit 2 will be in cold shutdown within the next 36 hours. When the bus was not restored within two hours, Dominion commenced activities to be in cold shutdown within the next 36 hours. At 1347 on February 27, 2014, Dominion successfully removed the degraded cell from battery '201B' by installing a modification which bypassed the cell and restored the bus to operability. Dominion exited the TS 3.8.2.3 action statement and returned Unit 2 to 100 percent power on February 28, 2014. Dominion generated condition report CR540795 for the issue.

In accordance with PI-AA-200, "Corrective Action," Dominion screened this issue as a significance level 1 event and assigned actions to perform a root cause evaluation (RCE001116). PI-AA-200 identifies significance level 1 events as significant conditions adverse to quality. 10 CFR 50, Appendix B, Criterion XVI, requires that in the case of significant conditions adverse to quality that the cause of the condition be determined and corrective actions taken to preclude repetition. Dominion established measures to identify the equipment failure mechanism which resulted in battery '201B' being inoperable and recommended corrective actions to preclude repetition as part of the root cause problem statement.

RCE001116 did not determine the cause of the equipment failure which resulted in battery '201B,' cell 27, having unsatisfactory low individual cell voltage test results. Within RCE001116 Dominion stated that, "[t]he cause of this failure has not been determined." However, Dominion generated a new condition report (CR540957) to send the failed cell to the manufacturer for analysis and tracked the results of this examination under a corrective action (CA278673). The manufacturer determined that there was "strong evidence" that sediment shorting occurred near the middle of the sediment chamber. The manufacturer documented that the evidence included a sediment mound observed in the middle of the cell which, while not large enough to cause a shorted condition in their lab, had likely settled due to handling during removal and transport. Dominion subsequently asserted two other potential failure modes. The first was potential failure of the plate separator material. The second was shorting across the top of the plates due to foreign material or sediment bridging. Dominion did not perform further evaluation or analysis.

Dominion established new temporary cell carts with the capability to be promptly placed into service in lieu of a single battery cell. This corrective action created the capability to promptly exit the TS 3.8.2.3 action statement given any future failure of a single battery cell. With respect to the three identified potential failure modes, Dominion concluded that no further actions were required and did not establish corrective actions to preclude repetition of any of the three failure modes. Although Dominion took action to potentially mitigate battery inoperability, the inspectors concluded that Dominion did not take required actions to preclude repetition of the condition(s) that caused the failure of battery '201B,' cell 27 and battery inoperability. For example, the inspectors noted that the documented sediment was abnormal for the age of the cell, that deficient cell charging practices can cause abnormal sedimentation, and that quarterly surveillances can reasonably identify abnormal sediment on the bottom of the cell. However, the quarterly surveillances did not identify abnormal sediment on the bottom of the cell. The inspectors reviewed condition and performance monitoring results documented in surveillances and performed an independent visual inspection of station battery '201B' and determined that present operability of battery '201B' was maintained. However, the inspectors observed multiple battery cells with abnormal sediment buildup on and under battery plates that were not previously entered into a tracking database or the corrective

action program that were required to be identified by surveillances. Dominion entered this issue into the corrective action program as CR1041881.

Analysis. The inspectors determined that Dominion's failure to take corrective actions to preclude repetition of a significant condition adverse to quality was a performance deficiency. This finding is more than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," because it was associated with the equipment performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, absent corrective actions to preclude repetition of the cause of the failure of battery '201B,' cell 27, the objective to ensure the reliability of safety related direct current (dc) battery systems was adversely affected. The inspectors also observed conditions which were consistent with precursors to the potential failure modes identified by Dominion that were not previously entered into a tracking database or the corrective action program.

In accordance with Inspection Manual Chapter 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), because the finding did not represent an actual failure of a system, function, or train of equipment and did not involve equipment specifically designed to mitigate a seismic, flooding, or severe weather initiating event (e.g., seismic snubbers, flooding barriers, tornado doors).

The inspectors determined that this finding has a cross-cutting aspect in the area of Human Performance, Challenging the Unknown, because Dominion identified three potential causes and when faced with an uncertain condition decided to not take corrective action to preclude repetition. (H.11)

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," states, in part, "In the case of significant conditions adverse to quality, the measures [established to assure that conditions adverse to quality are promptly identified and corrected] shall assure that the cause of the condition is determined and corrective action taken to preclude repetition." Contrary to the above, from February 26, 2014, to present, Dominion did not assure that corrective action was taken to preclude repetition of the cause of the failure of Millstone Unit 2 station battery '201B,' cell 27 and battery inoperability. Although Dominion has not restored compliance at this time, the inspectors reviewed documented surveillances and performed an independent visual inspection of battery 201B and determined that present operability of battery '201B' was maintained. Because this issue is of very low safety significance (Green) and Dominion has entered this issue into their corrective action program (CR1041881), this finding is being treated as an NCV consistent with the NRC Enforcement Policy Section 2.3.2.a. (NCV 05000336/2016009-03, Failure to Take Corrective Action to Preclude Repetition of the Condition that Caused Premature Failure of a Battery Cell)

## .2 Assessment of the Use of Operating Experience

### a. Inspection Scope

The inspectors reviewed a sample of condition reports associated with review of industry operating experience to determine whether Dominion appropriately evaluated the operating experience information for applicability to Millstone 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 Plan-of-the-Day meetings and pre-job briefs. However, the inspectors noted one example in which Dominion failed to properly consider industry operating experience as documented in Section 4OA2.1.b.(2)(b).

### 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.

Dominion performed a formal self-assessment, PIR1022517, of the Millstone corrective action program to assess the organization's effectiveness at problem identification and resolution and readiness for the biennial NRC problem identification and resolution inspection. As part of the self-assessment, Dominion evaluated the corrective actions for NCV 05000423/2015003-02, "Inadequate Procedural Direction to Mitigate a LOCA and Failure of an RSS Heat Exchanger Tube (Section 4OA3)," documented in the third quarter 2015 integrated inspection report, IR 05000336/2015003, 05000423/2015003, (ML15316A261). Dominion documented that a corrective action deferral request was flagged by a new process intended to highlight and minimize deferrals exceeding due dates based on the initial priority classification. Dominion documented that given this notification the issue was subsequently corrected, and the corrective actions were completed within procedurally required due dates based on the priority of the assignment. However, the inspectors identified that the corrective actions were not actually completed as documented in self-assessment PIR1022517 and identified a finding associated with this issue as documented in Section 4OA2.1.c.(1), NCV 05000423/2016009-01, "Failure to Promptly Correct Inadequate Procedural Direction for Responding to a LOCA with Failure of an RSS Heat Exchanger Tube."

c. Findings

No findings were identified.

.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. 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, Millstone 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 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 June 30, 2016, the inspectors presented the inspection results to Mr. John Daugherty, Site Vice President, and other members of the Millstone staff. During that discussion your staff requested to provide additional information for consideration. In-office review of the additional information continued by the NRC, and a telephonic exit meeting was conducted on July 22, 2016, with Mr. John Daugherty and other members of your staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

ATTACHMENT: SUPPLEMENTARY INFORMATION

**SUPPLEMENTARY INFORMATION**

**KEY POINTS OF CONTACT**

**Licensee Personnel**

J. Daugherty, Site Vice President  
C. Olsen, Plant Manager  
L. Armstrong, Director, Performance Recovery  
S. Stanley, Director, Safety and Licensing  
P. Anastas, Engineer  
J. Barile, System Engineer  
D. Butkovich, Maintenance Instructor  
J. Chappell, HP Technician  
G. Closius, Technical Specialist  
G. D'Auria, Chemistry Supervisor  
D. Dougherty, System Engineer  
B. Farquharson, Chemistry  
M. Ferrante, Planning Supervisor  
M. Hess, System Engineer  
J. Hoagland, Unit 2 Unit Supervisor  
C. Janus, Engineer  
S. Kappler, NOD  
J. Lanagan, Manager, Nuclear Oversight  
M. Legg, Nuclear Engineering  
L. Loomis, Engineer  
J. Majewski, System Engineer  
G. McGovern, Supervisor Nuclear Maintenance  
S. Minzy, System, Engineer  
D. Russo, System Engineer  
R. Shaufler, Design Engineer  
S. Smith, Manager, Operations  
C. Thomas, System Engineer  
E. Treptow, Manager, Site Engineering  
S. Turowski, RP Manager  
A. Vargas, Engineer  
N. Yonker, System Engineering Supervisor  
W. Watson, Engineering Supervisor  
B. Willikens, Manager, Organizational Effectiveness

**LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED**Opened and Closed

05000423/2016009-01	NCV	Failure to Promptly Correct Inadequate Procedural Direction for Responding to a LOCA with Failure of an RSS Heat Exchanger Tube (Section 4OA2.1.c.(1))
05000423/2016009-02	NCV	Failure to Implement Corrective Actions for Chronic Leakage at Residual Heat Removal Heat Exchanger Bottom Head Flanges (Section 4OA2.1.c.(2))
05000336/2016009-03	NCV	Failure to Take Corrective Action to Preclude Repetition of the Condition that Caused Premature Failure of a Battery Cell (Section 4OA2.1.c.(3))



## LIST OF DOCUMENTS REVIEWED

### Section 40A2: Problem Identification and Resolution

#### Audits and Self-Assessments

Audit 14-03: Operations  
 Audit 14-06: Radiation Protection, Process Control, Chemistry  
 Audit 15-05, Corrective Action, Independent Review and License Conditions, 7/16/15  
 Audit 16-03: Operations  
 CRS-32155, Respiratory Protection Program 2013  
 PIR 1020240, MPS 2016 Mid Cycle Review, 03/04/16  
 PIR 1022517, Millstone Power Station (MPS) Problem Identification and Resolution (PI&R)  
     Readiness Assessment, 03/30/2016  
 SAR002511, Respiratory Protection Program 2013  
 SAR003154, Force on Force Critique and UDF Process  
 SAR003206, Supplemental Performance and Behaviors Related to Industrial Safety  
 SAR003239, Conduct of Maintenance Activities

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

CR01-00934	CR555484	CR570140	CR581949	CR1014758
CR04-01858	CR555651	CR571189	CR581980	CR1015787
CR08-08072	CR555786	CR571407	CR582549	CR1016538
CR08-08586	CR555940	CR571519	CR582565	CR1017568
PA3025465	CR556361	CR571897	CR582569	CR1019990
CR316334	CR556697	CR572142	CR582817	CR1020229
CR319920	CR557062	CR573684	CR1001703	CR1022341
CR332501	CR558317	CR574558	CR1002748	CR1022923
CR335122	CR559444	CR574935	CR1003089	CR1024447
CR338253	CR560039	CR575573	CR1003265	CR1025211
CR365994	CR561061	CR576096	CR1004791	CR1026919
CR366620	CR561077	CR576159	CR1004795	CR1027548
CR389025	CR561796	CR576518	CR1004796	CR1029390
CR402338	CR562570	CR576749	CR1005259	CR1032590
CR440350	CR562580	CR576857	CR1005368	CR1034447
CR443195	CR562613	CR577424	CR1006420	CR1034458
CR466844	CR562638	CR577425	CR1006435	CR1034625
CR484429	CR562887	CR577426	CR1006512	CR1035088
CR518537	CR563284	CR577427	CR1007447	CR1037420
CR521475	CR563469	CR577428	CR1008712	CR1037691
CR534421	CR563508	CR577622	CR1009381	CR1038147
CR540795	CR563658	CR578418	CR1009649	CR1038272
CR551059	CR565062	CR578817	CR1011187	CR1039447*
CR551086	CR565386	CR579443	CR1011843	CR1039453*
CR551651	CR566762	CR579753	CR1012084	CR1039470
CR553970	CR567380	CR580958	CR1012887	CR1039552*
CR554243	CR568741	CR581395	CR1014333	CR1039577*
CR554443	CR568965	CR581861	CR1014751	CR1040069*
CR555224	CR568999	CR581935	CR1014754	CR1040104*
CR555448	CR569510	CR581938	CR1014756	CR1040291*

CR1041133*	CR1041382*	CR1041442*	CR1041729*	CR1042417*
CR1041146*	CR1041396*	CR1041466*	CR1041730*	
CR1041262*	CR1041399*	CR1041487*	CR1041870	
CR1041280*	CR1041424*	CR1041491*	CR1041881*	
CR1041281*	CR1041439*	CR1041727*	CR1042248*	

### Drawings

25212-26904, P&ID Chemical & Volume Control, Sheet 1, Revision 54

25212-26904, P&ID Chemical & Volume Control, Sheet 4, Revision 30

### Operating Experience

GL 88-05, Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants

NRC Information Notice 2006-005, Possible Defect in Bussmann KWN-R and KTN-R Fuses

NRC Information Notice 2015-13, Main Steam Isolation Valve Failure Events

NRC Information Notice 2016-01, Recent Issues Related to the Commercial Grade Dedication of Allen Bradley 700-RTC Relays

Part 21 Report 2015-26-00, Potentially Unqualified Component in Certain Allen Bradley Model 700RTC Timing Relays

Part 21 Report 2015-55-00, Notification of Product Anomaly Related to Namco EA180 & EA170 Limit Switches Manufactured in a Specific Date Range

Regulatory Issue Summary 15-15, Information Regarding a Specific Exemption in the Requirements for the Physical Protection of Category 1 and Category 2 Quantities of Radioactive Material

### Non-Cited Violations and Findings

NCV 05000336/2014003-01, Failure to Maintain Adequate Procedure for RCS Drain/Fill

NCV 05000336/2014003-02, Failure to Utilize Respiratory Protection as Specified in Work Control Documents

NCV 05000336/2014003-03 and 05000423/2014003-03, Failure to Adequately Maintain EALs

NCV 05000423/2014005-02, Failure to Manage Risk of RSST Testing

NCV 05000423/2014005-03, Failure to Correct Multiple 'A' HVK Start and Runtime Failures

NCV 05000423/2014011-03, Failure to Correctly Implement EOPs

NCV 05000336/2014403-03 and 05000423/2014403-03, Incomplete Pre-Access FFD Test Prior to Granting Unescorted Access

NCV 05000423/2015001-01, Failure to Identify Charging and Primary Closed Cooling Water Area Heater Transformers Equipment Qualification Non-conformance

NCV 05000336/2015001-02, Failure to Replace Defective Fuses in the 'A' EDG Resulting in Generator Failure

NCV 05000423/2015003-01, Change of Pump Reference Values Contrary to ASME OM

NCV 05000423/2015003-02, Inadequate Procedural Direction to Mitigate a LOCA and Failure of an RSS Heat Exchanger Tube

NCV 05000336/2015007-01, Reactor Building Closed Cooling Water System Pump Oil Leakage Results in Technical Specification Inoperability

NCV 05000336/2015012-01, Failure to Implement Procedural Guidance during a Loss of RCS Inventory

Procedures

AOP 2560, Storms, High Winds, and High Tides, Revision 16  
 AOP 2572, Loss of Shutdown Cooling, Revision 010-00  
 AOP 2579B, Millstone Unit 2 Fire Procedure for Hot Standby Appendix R Fire Area R-2,  
 Revision 9  
 AOP 3569, Severe Weather Conditions, Revision 22  
 AOP 3573, Radiation Monitor Alarm Response, Revision 20  
 AOP 3573, Radiation Monitor Alarm Response, Revision 21  
 AOP 3573, Radiation Monitor Alarm Response, Revision 22  
 C OP 200.18, Time Critical Operator Action Validation and Verification, Revision 2  
 C SP 760, Battery Discharge Test, Revision 6  
 CM-AA-REA-1001, Request for Engineering Assistance, Revision 4  
 CP 2802N, Primary Systems Sampling and Analysis, Revision 4  
 EC-AA-110, Identifying and Addressing Nuclear Safety and Quality Concerns, Revision 1  
 ER-AA-101, System Engineering Walkdowns, Revision 1  
 ER-AA-103, System Engineering Handbook, Revision 1  
 ER-AA-MRL-100, Implementing Maintenance Rule, Revision 10  
 LI-AA-1002, Safety Culture Review, Revision 4  
 MA-AA-103, Conduct of Troubleshooting  
 MA-MP-1004, Fix It Now (FIN) Team, Revision 0  
 MP 2701F, Lubrication, Revision 020-00  
 MP-PROC-000-EP-AA-303, Equipment Important to Emergency Response, Revision 12  
 MP-PROC-OPS-AOP-2560, Storms, High winds and High Tides, Revision 16  
 MP-PROC-OPS-AOP-3569, Severe Weather Conditions, Revision 21  
 MP-PROGRAM-000-DOM-QA-1, Nuclear Facility Quality Assurance Program Description,  
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 NO-AA-IAP-101, Internal Audit Program, Revision 0  
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 OP-AA-102, Operability Determination, Revision 14  
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 OP-AA-1500, Operational Configuration Control, Revision 12  
 OP-AA-200, Equipment Clearance, Revision 23  
 PI-AA-100-1003, Self-Evaluation, Revision 16  
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 PI-AA-200-2001, Trending, Revision 6  
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 PI-AA-300, Cause Evaluation, Revision 9  
 PI-AA-300-3001, Root Cause Evaluation, Revision 7  
 PI-AA-300-3002, Apparent Cause Evaluation, Revision 11  
 PI-AA-300-3003, Common Cause Evaluation, Revision 1  
 PI-AA-300-3004, Cause Evaluation Methods, Revision 5  
 PI-AA-300-3006, Equipment Apparent Cause Evaluation (E-ACE), Revision 0  
 SP 2669A, PEO Rounds, Revision 018  
 SP 3646B.8, Emergency Generator Fuel Oil Particulate Sample Analysis, Revision 012-01  
 SP 3670.1-001, Mode 1-4 Daily and Shiftly Control Room Rounds, Revision 35  
 WM-AA-100, Work Management, Revision 26

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WO53102585023	WO53102837150	WO53M30410235	WO53M30504926
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 2344B – 480 VAC Motor Control Centers, System Health Reports for 1Q14, 1Q15, 1Q16  
 2345C – 125 VDC Distribution, System Health Reports for 1Q14, 1Q15, 1Q16  
 3342, 3343 – 6.9kV and 4.16kV Distribution, System Health Reports for 1Q14, 1Q15, 1Q16  
 3344A – 480 VAC Load Centers, System Health Reports for 1Q14, 1Q15, 1Q16  
 3344B – 480 VAC Motor Control Centers, System Health Reports for 1Q14, 1Q15, 1Q16  
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**LIST OF ACRONYMS**

ADAMS	Agency-wide Documents Access and Management System
AOP	abnormal operating procedure
CARB	Corrective Action Review Board
CFR	Code of Federal Regulations
dc	direct current
EAL	emergency action level
ECCS	emergency core cooling system
EOP	emergency operating procedure
FSAR	final safety analysis report
IMC	Inspection Manual Chapter
IN	Information Notice
IR	inspection report
LOCA	loss-of-coolant accident
NCV	non-cited violation
NRC	Nuclear Regulatory Commission
PARS	Publicly Available Records System
RHS	residual heat removal system
RSS	recirculation spray system
TDAFW	turbine-driven auxiliary feedwater
TS	technical specification(s)
VDC	volts direct current