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

June 12, 2015

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

SUBJECT: MILLSTONE POWER STATION UNITS 2 AND 3 - NRC COMPONENT DESIGN BASES INSPECTION REPORT 05000336/2015007 AND 05000423/2015007

Dear Mr. Heacock:

On May 1, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Millstone Power Station, Units 2 and 3. The enclosed inspection report documents the inspection results, which were discussed on May 1, 2015, with Mr. John Daugherty, Site Vice President, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. In conducting the inspection, the team examined the adequacy of selected components to mitigate postulated transients, initiating events, and design basis accidents. The inspection involved field walkdowns, examination of selected procedures, calculations and records, and interviews with station personnel.

This report documents three NRC-identified finding, two of which were of very low safety significance (Green) and the third was determined to be of Severity Level IV (SL IV) significance. All of the findings were determined to be violations of NRC requirements. However, because of the very low safety significance and SL IV and because they were all entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCV) consistent with Section 2.3.2.a of the NRC's Enforcement Policy. If you contest any of the NCVs in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, U.S. 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 aspect 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 Docket Room or from the Publicly Available Records component of NRC's document system, Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA William A. Cook for/

Paul G. Krohn,Chief
Engineering Branch 2
Division of Reactor Safety

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

Enclosure:
Inspection Report 05000336/2015007 and 05000423/2015007
w/Attachment: Supplemental Information

cc w/encl.: Distribution via ListServ

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.:	50-336, 50-423
License Nos.:	DPR-65, NPF-49
Report Nos.:	05000336/2015007 and 05000423/2015007
Licensee:	Dominion Nuclear Connecticut, Inc.
Facility:	Millstone Power Station, Units 2 and 3
Location:	P.O. Box 128 Waterford, CT 06385
Inspection Period:	March 30 through May 1, 2015
Inspectors:	K. Mangan, Senior Reactor Inspector, Division of Reactor Safety (DRS), Team Leader S. Pindale, Senior Reactor Inspector, DRS J. Ayala, Reactor Inspector, DRS J. Patel, Reactor Inspector, DRS L. McKown, Millstone Resident Inspector, Division of Reactor Projects (DRP) W. Sherbin, NRC Mechanical Contractor G. Morris, NRC Electrical Contractor
Approved By:	Paul G. Krohn, Chief Engineering Branch 2 Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000336/2015007, 05000423/2015007; 3/30/2015 – 5/01/2015; Millstone Power Station, Units 2 and 3; Component Design Bases Inspection.

The report covers the Component Design Bases Inspection conducted by a team of five U.S. Nuclear Regulatory Commission (NRC) inspectors and two NRC contractors. Two findings of very low safety significance (Green) and one Severity Level IV violation were identified. The findings were considered to be a non-cited violation (NCV). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process." 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.

NRC-Identified Findings

Cornerstone: Mitigating Systems

Green: The team identified a non-cited violation (NCV) of Millstone Power Station Unit 2, Technical Specification (TS) 3.7.3.1 the reactor building component cooling water (RBCCW) system Limiting Condition of Operation (LCO) in that Dominion failed to maintain two loops of RBCCW operable. The team found that following the identification of a degraded condition for the "C" RBCCW pump, Dominion incorrectly concluded the loop remained operable. Specifically, the team determined that from February 4 to February 23, 2015, the RBCCW "B" loop was inoperable because oil leakage from the "C" RBCCW outboard pump bearing would have caused the complete loss of oil to the pump bearing, without operator compensatory action, before the "C" RBCCW train would have completed its design basis 30-day mission time.

Using IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," Section A, "Mitigating Systems, Structures or Components and Functionality," the team determined that the finding required a detailed risk evaluation due to actual loss of function of at least a single train for greater than its TS allowed outage time. The Region I Senior Reactor Analyst (SRA) identified that because the finding involved the "C" RBCCW pump function to run for its mission time, the only accident events adversely impacted are the large break loss of coolant accident (LLOCA) sequences. The condition was conservatively modeled assuming an exposure period of one year with the "C" RBCCW pump failure to run basic event set to True. The resultant change in risk was estimated at mid E-8, or very low safety significance (Green). The dominated risk sequences involve a LLOCA with the failure of the remaining RBCCW pumps due to common cause. Since the estimated risk increase was less than 1E-8, no additional evaluation of external events contribution or change in large early release frequency (LERF) was required. The team concluded that this issue has a cross-cutting aspect in the Human Performance cross-cutting area of Conservative Bias: Individuals use decision-making practices that emphasize prudent choices over those that are simply allowable. A proposed action is determined to be safe in order to proceed, rather than unsafe in order to stop. Specifically, Dominion determined that the qualitative bubbler leak rate was acceptable without evaluation against quantified operability criteria. (H.14) (Section 1R21.2.1.5)

Severity Level IV: The team identified a Severity Level IV, non-cited violation (NCV) of Title 10 of the *Code of Federal Regulations* (10 CFR) 50.59, "Changes, Tests, and Experiments," in that Dominion failed to perform a written evaluation to provide the bases for determining whether a change to the facility required a license amendment. Specifically, the team identified that contrary to 10 CFR 50.59, Dominion failed to properly evaluate operator compensatory actions to refill an oil bubbler on the "C" reactor building component cooling water (RBCCW) pump that was leaking oil at a rate that would have prevented the pump from meeting its design basis 30-day mission time. The team identified that contributing to this performance deficiency was that station procedure OP-AA-102, Attachment 1, Immediate Operability Determination Guidelines, Step 7.c., associated with the evaluation of oil and coolant leakage in order to establish operability for this type of degraded condition, incorrectly instructs the Dominion staff that the use of compensatory actions is acceptable without performing a formal operability determination.

In accordance with the NRC Enforcement Policy Section 6.1, the team used IMC 0609 to inform the severity of this 10 CFR 50.59 violation. Per IMC 0609, the team determined that the finding required a detailed risk evaluation due to actual loss of function of at least a single train for greater than its TS allowed outage time. The Region I SRA identified that because the finding involved the "C" RBCCW pump function to run for its mission time, the only accident events adversely impacted are the LLOCA sequences. The condition was conservatively modeled assuming an exposure period of one year with the "C" RBCCW pump failure to run basic event set to True. The resultant change in risk was estimated at mid E-8, or very low safety significance (Green). The dominated risk sequences involve a LLOCA with the failure of the remaining RBCCW pumps due to common cause. Since the estimated risk increase was less than 1E-8, no additional evaluation of external events contribution or change in LERF was required. Accordingly, per Section 6.1.d of the NRC Enforcement Policy, the severity of the violation of 10 CFR 50.59 was determined to be Severity Level IV, as it resulted in conditions evaluated as having very low safety significance (Green) by the Significant Determination Process (SDP).

There is no cross-cutting aspect associated with this violation as cross-cutting aspects are not assigned to traditional enforcement evaluations. (Section 1R21.2.1.5)

Green: The team identified a finding of very low safety significance (Green) involving a non-cited violation (NCV) of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix B, Criterion III, "Design Control," in that Dominion did not correctly evaluate the capability of 4.16 kV breakers to function properly during 3-phase bolted fault design condition. The team reviewed Millstone Unit 2 electrical distribution system analysis calculation (MP2-ENG-ETAP-04014E2), which evaluated adequacy of the circuit breakers for their interrupting rating in accordance with the Institute of Electrical and Electronics Engineers/American National Standards Institute (IEEE/ANSI) C37 series standards, and determined that Dominion's short-circuit fault current calculation did not assume the maximum plant operating voltage as a pre-fault voltage at the 4.16 kV bus and did not evaluate the plant configuration when emergency diesel generators (EDG) are operating in parallel with offsite power on the associated 4.16 kV emergency bus. The team determined this short-circuit fault current calculation was not in accordance with IEEE/ANSI C37 series standards and was non-conservative in some cases. Dominion entered the issue into their corrective action program and performed additional analysis to determine if the inability of the breaker to interrupt the fault current would result in the fault current affecting the other safety related bus. Dominion concluded that the other bus would not be affected. The team reviewed the analysis and determined it to be acceptable.

The finding was determined to be more than minor because it was associated with the Mitigating Systems cornerstone Design Control attribute and adversely affected the cornerstone's objective and was similar to Example 3.j in Appendix E of the NRC IMC 0612. Using the NRC IMC 0609, "Significance Determination Process," Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," the finding was determined to be of very low safety significance (Green). There was no crosscutting aspect assigned to the finding because it was not an indicative of current performance. (Section 1R21.2.1.7)

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R21 Component Design Bases Inspection (IP 71111.21)

.1 Inspection Sample Selection Process

The team selected risk significant components for review using information contained in the Millstone Probabilistic Risk Assessment (PRA) and the U.S. Nuclear Regulatory Commission's (NRC) Standardized Plant Analysis Risk (SPAR) model for the Millstone Power Station. Additionally, the team referenced the Risk-Informed Inspection Notebook for the Millstone Power Station in the selection of potential components for review. In general, the selection process focused on components that had a risk achievement worth (RAW) factor greater than 1.3 or a risk reduction worth (RRW) factor greater than 1.005. The components selected were associated with both safety-related and non-safety related systems and included a variety of components such as pumps, transformers, operator actions, electrical busses, and valves.

The team initially compiled a list of components based on the risk factors previously mentioned. Additionally, the team reviewed the previous component design bases inspection (CDBI) reports (05000336/2009006 and 05000423/2009006, 05000336/2006010 and 05000423/2006010, and 05000336/2012007 and 05000423/2012007) and excluded those components previously inspected. The team then performed a margin assessment to narrow the focus of the inspection to 21 components and 5 operating experience (OE) items. The team selected one component, containment air recirculation fan, based on large early release frequency (LERF) implications. The team's evaluation of possible low design margin included consideration of original design issues, margin reductions due to modifications, or margin reductions identified as a result of material condition/equipment reliability issues. The assessment also included items such as failed performance test results, corrective action history, repeated maintenance, Maintenance Rule (a)(1) status, operability reviews for degraded conditions, NRC resident inspector insights, system health reports, and industry OE. Finally, consideration was also given to the uniqueness and complexity of the design and the available defense-in-depth margins.

The inspection performed by the team was conducted as outlined in NRC Inspection Procedure (IP) 71111.21. This inspection effort included walkdowns of selected components; interviews with operators, system engineers, and design engineers; and reviews of associated design documents and calculations to assess the adequacy of the components to meet design basis, licensing basis, and risk-informed beyond design basis requirements. Summaries of the reviews performed for each component and OE sample are discussed in the subsequent sections of this report. Documents reviewed for this inspection are listed in the Attachment.

.2 Results of Detailed Reviews

.2.1 Results of Detailed Component Reviews (21 samples)

.2.1.1 Unit 2, “B” High Pressure Safety Injection Pump (P41B)

a. Inspection Scope

The team inspected the “B” high head safety injection pump, P41B, to evaluate if it was capable of performing its design basis functions. Specifically, the team assessed the pump’s ability to meet design basis head and flow requirements during design basis events. The team reviewed drawings, calculations, hydraulic analyses, procedures, system modifications, and preventive maintenance activities to determine the adequacy of high head safety injection pump performance. The team also determined whether design inputs were properly translated into system procedures and tests and reviewed completed surveillance tests to determine if the results adequately demonstrated the capability of the pump to meet design basis requirements under transient and accident conditions. In addition, the team reviewed the adequacy of water supply sources to the pump, including an assessment of the potential for vortex conditions and the ability to transfer the pump’s suction during the recirculation phase of an accident. The team also performed field walkdowns to assess the material condition of the pump and supporting equipment. Finally, the team reviewed corrective action documents and system health reports to determine whether there were any adverse operating trends and to assess Dominion's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.2 Unit 2, “A” Service Water Pump (SW-P-5A)

a. Inspection Scope

The team inspected the “A” service water (SW) pump, SW-P-5A, to evaluate if it was capable of performing its design basis functions. Specifically, the team evaluated whether the SW pump provided adequate flow so that the SW system was capable of transferring the maximum heat loads, from plant primary and secondary heat source to the environment. The team reviewed applicable portions of the Updated Final Safety Analysis Report (UFSAR), design basis documents (DBD), and drawings to identify the design basis requirements for the pump in order to evaluate whether the pump capacity was sufficient to provide adequate flow to the safety-related components supplied by the SW system during design basis accidents (DBA). The team reviewed design calculations to assess available pump net positive suction head (NPSH), submergence requirements, worst case pump run-out conditions, and to evaluate the capability of the pump to provide required flow to supplied components under design basis conditions. The team ensured changes that impacted flow requirements to individual SW system loads due to pipe replacement and modifications were properly evaluated. The team reviewed the SW pump in-service test (IST) results and SW system flow verification tests to determine if

adequate system flow was available. Specifically, the team reviewed pump data trends for vibration, pump differential pressure, and flow rate test results to verify acceptance criteria were met and acceptance limits were adequate. Additionally, the motor data, degraded voltage conditions, and voltage drop calculation results were reviewed to confirm that the pump motor would have sufficient voltage and power available to perform its safety function at degraded voltage conditions. The team interviewed the system and design engineers as well as maintenance staff who supported walkdowns of the pump to evaluate its material condition, assess the pump's operating environment, and gage the station's capability to implement inclement weather procedures. Finally, the team reviewed corrective action documents and system health reports to determine whether there were any adverse operating trends and to assess Dominion's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.3 Unit 2, Service Water Air Operated Valves (AOV231B and AOV89B)

a. Inspection Scope

The team inspected the emergency diesel generator (EDG) SW heat exchanger supply and bypass air operated valves (AOV), AOV231B and AOV89B, to determine whether they were capable of meeting their design basis function. Specifically, the team determined whether the valves would reposition as required to ensure SW would be supplied to the EDG heat exchangers following an EDG start signal. The team reviewed the UFSAR, the Technical Specifications (TS), the TS Bases, and the IST basis documents to identify the design basis requirements of the valves. The team reviewed drawings, operating and maintenance procedures, and completed maintenance records to determine whether the safety function was maintained. The team reviewed valve testing procedures and IST results, including stroke time, to verify acceptance criteria were adequate and that performance was not degrading. The team discussed design, operation, permanent modifications, and component history of the valves with engineering and operations staff to evaluate performance history and overall component health. The team also conducted a walkdown of the valves to assess its material condition and to verify the installed configuration was consistent with plant drawings, procedures, and the design basis. Finally, the team reviewed corrective action documents to verify Dominion was identifying and correcting issues with the valve, and to verify there were no adverse trends.

b. Findings

No findings were identified.

.2.1.4 Unit 2, Operator Action to Cross-tie Fire Water System to Auxilliary Feedwater

a. Inspection Scope

The team inspected the manual operator action that establishes an alternate source of suction water to the auxiliary feedwater (AFW) pumps in response to a loss of the normal AFW supply. Specifically, the team reviewed Dominion's actions to align the fire water system to supply the AFW pump suction and the capability of the fire water system to supply required water inventory to the AFW system. The team selected this sample because of the extent of actions performed outside of the control room and the infrequent operation of this alignment. The team reviewed Dominion's PRA and human reliability analysis (HRA) studies to determine when and how quickly operator actions were needed to provide the alternate AFW supply to meet PRA success assumptions. The team interviewed equipment operators, reviewed associated operating and alarm response procedures, walked down applicable portions of the affected systems in the plant, and observed an equipment operator simulate the in-field portions of the procedure to evaluate the ability of the operators to perform the required actions. The team also reviewed AFW and fire water system design documents to determine whether design bases were appropriately evaluated and incorporated into this system alignment. The team evaluated the available process margins based on fluid pressures and flow rates, component design values, and limiting operational parameters established in engineering analyses and calculations. The team compared the available margins to the predicted or assumed margins in engineering analysis and calculations to verify the reasonableness of the design and operating values. Finally, the team reviewed corrective action documents and system health reports to determine whether there were any adverse operating trends and to assess Dominion's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.5 Unit 2, "C" Reactor Building Closed Cooling Water Pump (RB-P-11C)

a. Inspection Scope

The team inspected the "C" reactor building closed cooling water (RBCCW) pump, RB-P-11C, to determine whether it was capable of meeting its design basis function. Specifically, the team evaluated the ability of the RBCCW system to provide cooling water to essential components under normal, transient, and accident conditions. The team evaluated whether the pump capacity was sufficient to provide adequate flow to the safety-related components supplied by the system during DBAs. The team reviewed drawings, calculations, hydraulic analyses, procedures, system health reports, and the system DBD to ensure consistency with design and licensing bases requirements. Additionally, the motor data, degraded voltage conditions, and voltage drop calculation results were reviewed to confirm that the pump motor would have sufficient voltage and power available to perform its safety function at degraded voltage conditions. The team also reviewed completed pump surveillance tests to ensure pump performance and procedure acceptance criteria were consistent with system flow calculations assumptions.

The team walked down the RBCCW pumps and accessible portions of the system and reviewed the system health report and maintenance records to assess Dominion's configuration control, operating environment of the pumps, and the system's overall material condition. Finally, the team reviewed corrective action documents and system health reports to determine whether there were any adverse operating trends and to assess Dominion's ability to evaluate and correct problems.

b. Findings

.1 Introduction. The team identified a Green, non-cited violation (NCV) of Millstone Power Station Unit 2, TS 3.7.3.1 RBCCW system Limiting Condition of Operation (LCO) in that Dominion failed to maintain two loops of RBCCW operable. The team found that following the identification of a degraded condition for the "C" RBCCW pump, Dominion incorrectly concluded the loop remained operable. Specifically, the team determined that from February 4 to February 23, 2015, the RBCCW "B" loop was inoperable because oil leakage from the "C" RBCCW outboard pump bearing would have caused the complete loss of oil to the pump bearing, without operator compensatory action, before the "C" RBCCW train would have completed its design basis 30-day mission time.

Description. The team reviewed the design of the RBCCW system and found that the RBCCW pumps have outboard bearing lubricating oil systems which ensure operability of the pump by maintaining adequate oil to the bearings. The team noted that operators ensure adequate oil to the bearings by monitoring and maintaining level in an eight ounce transparent reservoir or "bubbler." The team noted that the bubbler provides makeup inventory as necessary to support pump operation through all design basis events. During operation, the pump bearing is not expected to consume significant quantities of oil.

The team reviewed Condition Report (CR) 564871 dated November 9, 2014, in which Dominion identified low oil level in the "C" RBCCW pump outboard bearing oil bubbler. The team reviewed six additional CRs created between November 25, 2014, and March 31, 2015, in which Dominion identified that the "C" RBCCW pump outboard oil bubbler required oil to be added to the bubbler and some cases identified oil leakage from the bubbler. The team reviewed the associated operability assessment for each CR noting that the licensee concluded that the pump was operable because the actual leak rate was less than the quantified 30-day mission time leak rate acceptance criteria. However, the team's review determined that Dominion had not quantified the leak rate in any of the CRs. The team reviewed control room logs, CRs, and work orders to assess the degraded condition of the bubbler. Based on this review, the team determined that the actual leak rate was as high as 0.50 ounces per day from February 4 through February 23, 2015, and concluded that this leak rate would have resulted in the oil bubbler emptying in 2 to 8 days vice the 30-day pump mission time, without operator action to add oil.

Following the team's identification of this issue, Dominion entered the issue into their corrective action program and developed a revised operability determination that concluded the pump remained operable because operators would be able to identify low oil levels in the bubbler and refill the bubbler after a DBA. Dominion's operability

determination concluded this operator action was reasonable and consistent with Dominion's routine actions which added oil on multiple occasions between November and April. In addition, Dominion concluded the pump would be accessible post-accident.

During the team review of the revised operability determination the team identified that the post-accident dose estimations for equipment environmental qualification, as well as, planned emergency operating procedure actions in the area of the pump indicate that an individual performing an oil filling evolution would receive a dose as high as 2.9 Rem within the first few hours following a DBA, 876 mRem at approximately 2 days post-accident, and approximately 315 mRem at 8 days post-accident. The team also determined that following a DBA operator rounds would likely be suspended for some unquantified number of days due to general post-accident dose concerns. Specifically, the team noted, in accordance with RP-AA-103, *As Low As Reasonably Achievable* (*ALARA) Program*, Revision 2, and RP-AA-106, *Radiological Work Control Program*, Revision 3, this level of exposure would require ALARA committee reviews, radiation worker permits, and pre-job briefs prior to allowing entry into the pump room due to post-accident dose rates. The team also noted that the RBCCW pumps do not have a low oil bearing level alarm function and that operators had not been provided specific written guidance to ensure this degraded condition was monitored and addressed post-accident.

During the inspection Dominion quantified the current leakage of the "C" RBCCW pump outboard bearing oil bubbler and determined that the leakage from the lubrication system had been reduced by maintenance activities performed on February 23, 2015, which tightened the bubbler piping connections such that the outboard bearing lubrication system would support the pump 30-day mission time, without operator action. The team reviewed this analysis and found Dominion's conclusions to be reasonable. Additionally, Dominion entered the issue into their corrective action program and created a work activity to correct the remaining leakage (CR 576963, WO 53102571327).

The team identified that bubbler levels between February 4 and February 23, 2015, were recorded between 1/8 and 3/4 full. As a result, the team determined that the observed oil levels and leak rate (calculated by the team) would have resulted in the pump oil bubbler running out of oil in two to eight days. Therefore, Dominion would likely not have been able to identify that the bubbler was out of oil in time to take compensatory actions in order to prevent pump failure. Specifically, the team concluded that Dominion's basis for operability during this time frame was not supported because the pump would not have been able to meet its 30-day mission time and operators would not have been able to identify and refill the bubbler due to radiation dose levels in the room. As a consequence, the team concluded that TS LCO 3.7.3.1 requiring that two RBCCW loops remain operable was not met between February 4 and February 23, 2015.

Analysis. The team determined that the failure of Dominion to assess the degraded condition of the RBCCW pump oil system and take appropriate actions in accordance with TS 3.7.3.1 was a performance deficiency that was reasonably within Dominion's ability to foresee and correct. Specifically, from February 4 to February 23, 2015, Dominion incorrectly concluded that the RBCCW system was operable following the identification of the "C" RBCCW outboard pump bearing oil system leaking oil at a rate that would have resulted in the pump not meeting its 30-day mission time. This finding

was more than minor in accordance with Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," dated September 7, 2012, as it adversely affected the equipment performance attribute of the Reactor Safety Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the capability of the "C" RBCCW pump train was challenged based upon Dominion's failure to ensure that "C" RBCCW pump outboard bearing lubricating oil assembly was able to support the system design basis 30-day mission time.

Using IMC 0609, "Significance Determination Process," Attachment 4, "Initial Characterization of Findings," and IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," Section A, "Mitigating Systems, Structures or Components and Functionality," the team determined that the finding required a detailed risk evaluation due to actual loss of function of at least a single train for greater than its TS allowed outage time. The Region I Senior Reactor Analyst (SRA) identified that because the finding involved the "C" RBCCW pump failure to run for its mission time, the only accident events adversely impacted are the large break loss of coolant accident (LLOCA) sequences. The condition was conservatively modeled assuming an exposure period of one year with the "C" RBCCW pump failure to run basic event set to True. The resultant change in risk was estimated at mid E-8, or very low safety significance (Green). The dominated risk sequences involve a LLOCA with the failure of the remaining RBCCW pumps due to common cause. Since the estimated risk increase was less than 1E-8, no additional evaluation of external events contribution or change in LERF was required.

The team used IMC 0310, "Aspects within the Cross-Cutting Areas," dated December 4, 2014, to conclude that this issue has a cross-cutting aspect in the Human Performance cross-cutting area of Conservative Bias: Individuals use decision-making practices that emphasize prudent choices over those that are simply allowable. A proposed action is determined to be safe in order to proceed, rather than unsafe in order to stop. Specifically, Dominion determined that the qualitative bubbler leak rate was acceptable without evaluation against quantified operability criteria. (H.14)

Enforcement. Millstone Unit 2, TS 3.7.3.1 states, in part, "Two reactor building closed cooling water loops shall be OPERABLE." Contrary to the above, from February 4, 2015, through February 23, 2015, Dominion failed to maintain the "B" RBCCW loop operable as the "C" RBCCW pump outboard bearing was leaking oil at rate which would have only supported 2 to 8 days of the 30-day mission time. Dominion restored compliance with the LCO following maintenance on February 23, 2015. Because this issue is of very low safety significance (Green) and Dominion restored compliance with the TS LCO and entered this issue into their corrective action program (CR 576963), this finding is being treated as an NCV consistent with the NRC Enforcement Policy Section 2.3.2. **(NCV 05000336/2015007-01, Reactor Building Closed Cooling Water System Pump Oil Leakage Results in Technical Specification Inoperability)**

.2 Introduction. The team identified a Severity Level IV, NCV of 10 CFR 50.59, "Changes, Tests, and Experiments," in that Dominion failed to perform a written evaluation to provide the bases for determining whether a change to the facility required a license

amendment. Specifically, the team identified that contrary to 10 CFR 50.59, Dominion failed to properly evaluate compensatory actions to refill an oil bubbler on the "C" RBCCW pump following identification of an oil leak that would have prevented the pump from meeting its design basis 30-day mission time. The team identified that contributing to this performance deficiency was that station procedure OP-AA-102, Attachment 1, Immediate Operability Determination Guidelines, Step 7.c., incorrectly instructs the Dominion staff that the use of compensatory actions for oil and coolant leaks is acceptable without performing a formal operability determination.

Description. During the team's review of actions taken by Dominion to address a degraded condition associated with oil leakage from the "C" RBCCW pump bearing, the team identified that Dominion did not perform a 10 CFR 50.59 screening or safety evaluation prior to implementing the compensatory measures credited for maintaining operability of the "C" RBCCW pump. Specifically, following identification by the team that the observed oil leakage prevented the pump from meeting its 30-day mission time, Dominion credited operators, through the use of procedure, MP 2701F, Lubrication, Attachment P011, *Reactor Building Closed Cooling Water Pump Lubrication Information Sheet*, Revision 005-03, to add oil to the "C" RBCCW pump outboard bearing post-accident, in order to maintain operability of the train. The team observed that Dominion used OP-AA-102, *Operability Determination*, Attachment 1, Revision 12, to evaluate the use of the interim compensatory action in order to restore operability of the RBCCW train. However, prior to implementing the compensatory action to ensure pump operability, a 50.59 screen/evaluation was not performed.

The team conducted a detailed review of Dominion's process for determining operability as implemented in accordance with OP-AA-102. The team determined the procedure directs operators to determine the impact on TS structure, system, and component (SSC) operability for a degraded, non-conforming, or unanalyzed condition using guidance provided in Attachment 1, Immediate Operability Determination Guidelines. The team noted that the Attachment allows the use of compensatory actions and associated procedural guidance to maintain the operability of SSCs without performing a formal operability evaluation. Specifically, OP-AA-102, Attachment 1, *Immediate Operability Determination Guidelines*, Step 7.c. states:

"IF the oil / coolant level in the SSC can be maintained during its mission time by replenishment and meets all the following criteria, THEN the equipment is operable and NO OD evaluation is required.

- Non-complex evolution capable of being performed by on-shift operators
- Can be accomplished with equipment in operation
- Replenishment frequency required with SSC in operation is greater than every 24 hours
- The area is accessible during the design events requiring SSC operation

IF all of the requirements above can NOT be met THEN an OD evaluation is required."

The team reviewed the Millstone licensing basis and found that the use of compensatory actions, such as operator actions or proceduralized maintenance activities, to maintain safety related SSCs operable was not part of the Millstone licensing basis. Specifically, the UFSAR does not discuss the use of operator compensatory actions to maintain safety related system operability. In addition, the team found that a 50.59 evaluation was not performed when Revision 1 of procedure OP-AA-102 was first implemented (July 13, 2007), and that no subsequent 10 CFR 50.59 evaluations have been performed by Dominion to evaluate the use of compensatory actions, per this procedure, since that time.

The team's review of OP-AA-102 identified that multiple sections of the procedure state when implementing compensatory actions verify a 10 CFR 50.59 review is completed in accordance with procedure CM-AA-400, 10 CFR 50.59, and 10 CFR 72.48, "Changes, Tests, and Experiments," Revision 4. The team reviewed CM-AA-400 and found that the implementing procedure is used to determine if a change to the facility would require a license amendment prior to implementation. The team noted that OP-AA-102, Attachment 1, Section 7.c. directs personnel to exit the operability determination evaluation process when determining the basis for operability for some oil or coolant leakage conditions. As a result, CM-AA-400 would not be entered and, therefore, a 10 CFR 50.59 review would not be performed to assess the use of procedure changes and associated compensatory actions that are being credited to restore the operability of safety related equipment with this type of degradation.

As discussed in Section .2.1.5.1 above, the team determined that it was not reasonable to conclude that the compensatory action being credited to address the RBCCW oil leak would have been successful, due to the significant expected post-accident dose operators would have been exposed to for both identifying and replenishing the low lubricating oil condition of the "C" RBCCW pump bearing during a postulated DBA.

Dominion entered this condition for evaluation within their corrective action program (CR 577964). On May 5, 2015, Dominion implemented a standing order, SO-15-010, reinforcing 10 CFR 50.59 regulatory requirements.

Analysis. The team determined that the failure to perform a written evaluation which provided the bases for the determination that operator compensatory actions did not require a license amendment was a violation of 10 CFR 50.59(d)(1). Specifically, Dominion failed to provide bases for not applying for a license amendment for the implementation of an interim compensatory measure, in lieu of an automatic design feature to maintain the capability of a TS SSC to meet its design basis mission time. Because this performance deficiency impacted the ability of the NRC to perform its regulatory function, the team evaluated the issue using the traditional enforcement process. In accordance with The NRC Enforcement Manual, Revison 9, Part II, *Enforcement of 10 CFR 50.59 and Related FSAR*, Sections 2.1.3.E.1 and 2.1.3.E.6, this violation was determined to be more than minor because Dominion failed to conduct a 10 CFR 50.59 screen or evaluation that, if performed, would likely have concluded that the change or operator compensatory actions would have required Commission review and approval prior to implementation.

In accordance with the NRC Enforcement Policy Section 6.1, the team used IMC 0609 to inform the severity of this 10 CFR 50.59 violation. As previously discussed in Section .2.1.5.1, the team determined that the finding required a detailed risk evaluation due to actual loss of function of at least a single train for greater than its TS allowed outage time. The Region I SRA identified that because the finding involved the "C" RBCCW pump failure to run for its mission time, the only accident events adversely impacted are the LLOCA sequences. The condition was conservatively modeled assuming an exposure period of one year with the "C" RBCCW pump failure to run basic event set to True. The resultant change in risk was estimated at mid E-8, or very low safety significance (Green). The dominated risk sequences involve a LLOCA with the failure of the remaining RBCCW pumps due to common cause. Since the estimated risk increase was less than 1E-8, no additional evaluation of external events contribution or change in LERF was required. Accordingly, per Section 6.1.d of the NRC Enforcement Policy, the severity of the violation of 10 CFR 50.59 was determined to be Severity Level IV, as it resulted in conditions evaluated as having very low safety significance (Green) by the SDP.

There is no cross-cutting aspect associated with this violation as cross-cutting aspects are not assigned to traditional enforcement evaluations.

Enforcement. Title 10 CFR 50.59, "Changes, Tests, and Experiments," Section (d)(1) states, in part, "The licensee shall maintain records of changes in the facility, of changes in procedures, and of tests and experiments made pursuant to paragraph (c) of this section. These records must include a written evaluation which provides the bases for the determination that the change, test, or experiment does not require a license amendment pursuant to paragraph (c)(2) of this section." 10 CFR 50.59(c)(1)(ii) states, in part, that a licensee may make changes in the procedures as described in the final safety analysis report (as updated), without obtaining a license amendment pursuant to Section 50.90 only if the change does not meet any of the criteria in paragraph (c)(2) of this section. Title 10 CFR 50.59(c)(2)(ii) requires, in part, that a licensee shall obtain a license amendment pursuant to Section 50.90 prior to implementing a proposed change if the change would result in more than a minimal increase in the likelihood of occurrence of a malfunction of an SSC important to safety previously evaluated in the final safety analysis report (as updated). Millstone Unit 2 final safety analysis report (as updated) Section 9.4 describes the RBCCW system. Contrary to the above, between February 4 and February 23, 2015, Dominion implemented a change in procedures as described in the final safety analysis report and did not include a written evaluation that provided the bases for the determination that the change did not require a license amendment pursuant to paragraph (c)(2). Specifically, Dominion credited the operator compensatory action of manually refilling oil leaking from the "C" RBCCW pump outboard bearing lubricating oil assembly as maintaining the operability of the degraded "C" RBCCW pump under postulated DBA conditions. However, Dominion did not perform an evaluation, which would have determined that this change would result in more than a minimal increase in the likelihood of occurrence of a malfunction of an SSC important to safety previously evaluated in the final safety analysis report (as updated) and would, therefore, require a license amendment. The team identified that Dominion procedure OP-AA-102, Attachment 1, *Immediate Operability Determination Guidelines*, Step 7.c. improperly allows Dominion staff to change the facility through the use compensatory actions to

maintain safety related SSC operability, without evaluating this change pursuant to 10 CFR 50.59(c)(2). Dominion prevented the use of that portion of procedure OP-AA-102 following the inspection and until properly revised. This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy because it was Severity Level IV and was entered into the Dominion corrective action program (CR 577964). **(NCV 05000336/05000423/2015007-02, Failure to Provide 10 CFR 50.59 Evaluation Associated with Implementation of Operability Determination Procedure)**

.2.1.6 Unit 2, "A" Containment Air Recirculation Fan Unit (F14A)

a. Inspection Scope

The team inspected the "A" containment air recirculation (CAR) fan unit, F14A, and associated cooler to assess whether they were capable of meeting their design basis function. Specifically, the team evaluated if the equipment was capable of removing heat from the containment during certain design basis events. The team reviewed drawings, calculations, hydraulic analyses, containment analysis, and the system DBD to determine the CAR fan design and licensing bases requirements. The team evaluated if Dominion ensured, through testing and flow balance measurements of the RBCCW system, that the flow needed to meet heat removal requirements, assumed in containment temperature and pressure response calculations, were being met for the CAR unit. The team also reviewed fan flow test results to determine whether the fan was capable of meeting air flow requirements assumed in the containment analysis. The team verified that the CAR fan surveillance testing was performed consistent with TS requirements. The team also performed a visual examination of control room CAR fan controls and 480Vac breakers at associated load centers. The team verified breaker overcurrent protective relay set-points were established that ensured the CAR fan motor and electrical bus were adequately protected and that the CAR unit was not subject to spurious tripping. Additionally, the team reviewed electrical diagrams associated with breaker and fan controls, and piping and instrument diagrams associated with containment ventilation and the RBCCW system to ensure all components of the CAR unit were appropriately included in a test or maintenance program. Finally, the team reviewed corrective action documents and system health reports, and interviewed system and design engineers to determine whether there were any adverse operating trends or existing issues affecting CAR unit reliability and to assess Dominion's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.7 Unit 2, 4kv AC Electric Bus (24C)

a. Inspection Scope

The team inspected the 4160 volts, alternating current (Vac) vital bus, 24C, to determine whether it was capable of performing its design basis function. The team reviewed the UFSAR, DBDs, and electrical distribution calculations including load flow, voltage drop, transient, and short-circuit analysis. This review was performed to evaluate the adequacy

and appropriateness of design assumptions, to evaluate whether bus capacity was exceeded, and to assess if bus voltages remained above minimum acceptable values under design basis conditions. The team reviewed the design and test results for automatic and manual transfers of alternating current (AC) power sources to determine whether they satisfied the design basis timing requirements. The team also reviewed the electrical overcurrent, undervoltage, and ground protective relay settings for selected circuits to evaluate whether the trip set points interfered with the ability of the supplied equipment to perform its safety function but were also set to provide adequate bus protection. The loss of voltage and degraded voltage relay surveillances, calibration results, and set point calculations were also reviewed to verify that they satisfied the requirements of the associated TSs. Additionally, the team reviewed system maintenance test results, interviewed system engineers, and conducted field walkdowns to verify that equipment alignment, nameplate data, and breaker positions were consistent with design drawings, and to assess the material condition of the bus. Finally, the team reviewed corrective action documents and system health reports and interviewed system and design engineers to determine whether there were any adverse operating trends or existing issues affecting bus reliability and to assess Dominion's ability to evaluate and correct problems.

b. Findings

Introduction. The team identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” in that, Dominion did not correctly evaluate the capability of 4.16 Kilovolts (kV) breakers to function properly during a severe fault condition. The team found the prospective fault currents on 4.16 kV load breakers would exceed the circuit breaker symmetrical interrupting rating of 250 MVA during a 3-phase bolted fault design condition. The team determined that this condition existed for multiple breakers on 24C and 24D emergency buses of Dominion’s Millstone Nuclear Power Station Unit 2.

Description. The team reviewed Dominion’s UFSAR and found that Section 8.2.2.2 describes 4.16 kV load breakers as having fault current interrupting capability of 250 MVA. The team also reviewed GE drawing GEZ-6105, “Power Circuit Breaker Specification for Type AM Circuit Breakers Mounted in Vertical Lift Metal Clad Equipment” and determined the installed breakers are rated in accordance with the Institute of Electrical and Electronics Engineers/American National Standards Institute (IEEE/ANSI) C37.06 with ratings as follow: 250 3-phase MVA class, 4.16 kV voltage class, 4.76 kV maximum voltage, and 36000A maximum symmetrical interrupting capability at 1.24 voltage range factor (K factor).

The team then reviewed Millstone Unit 2 electrical distribution system analysis calculation (MP2-ENG-ETAP-04014E2). This calculation evaluated Millstone Unit 2 electrical load flow, motor starting study, transient study, and short-circuit analysis. The team noted that the short-circuit analysis was performed to evaluate adequacy of the circuit breakers for their interrupting rating and the analysis evaluated different plant configurations such as power to the vital busses from the reserve station service transformer (RSST) feed, and normal station service transformer (NSST). The calculation was also used to evaluate operating scenarios such as reactor operation in Mode 1, Mode 6, and DBA scenarios.

During this review, the team found that the assumptions used in this design analysis for calculating short-circuit fault currents were not in accordance with IEEE/ANSI C37 series design standards and were non-conservative, in some cases. Specifically, the team found that the analysis did not assume the maximum plant operating voltage (4284 Vac versus 4144 Vac assumed) at the 4.16 kV bus in Mode 1 and did not consider the plant configuration when EDGs are operating in parallel with offsite power on the associated 4.16 kV emergency bus which is the system lineup during the monthly TS surveillances.

Following identification of the issue, Dominion revised the analysis to evaluate the capability of the affected safety related breakers to function properly during a worst case 3-phase bolted fault, including a case where the evaluation assumes 4284 Vac bus voltage and the EDG is paralleled with offsite power. Dominion found that the result of this analyzed case showed that the prospective fault currents exceeded the breaker maximum symmetrical interrupting capability. To address this deficiency, Dominion entered this issue in their corrective action program under CR 576783. Dominion performed single failure analysis for this configuration to determine whether the breaker fails to interrupt the fault on one bus, and/or would the fault current affect the other safety related bus. Dominion concluded that the other bus would not be affected. The team reviewed the analysis and agreed with the assessment.

Analysis. The team determined that Dominion's failure to correctly evaluate adequacy of the circuit breakers for their interrupting rating in accordance with IEEE/ANSI C37 series standards was a performance deficiency that was reasonable within Dominion's ability to foresee and prevent. The finding was more than minor because it adversely affected design control performance attribute of the mitigating system cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events. This issue was similar to example 3.j in Appendix E of the NRC IMC 0612. Specifically, Dominion used non-conservative pre-fault bus voltage and did not consider the plant configuration where EDG synchronized in parallel configuration to the bus as an input to the design analysis.

The team assessed this finding in accordance with IMC 0609, "Significance Determination Process," Attachment 4, "Initial Characterization of Findings," and IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," Section A, "Mitigating Systems, Structures or Components and Functionality," and determined that the finding was of very low safety significance (Green) because the performance deficiency resulted in a non-conforming condition that did not result in loss of operability or functionality of the 4.16 kV system. Specifically, Dominion performed additional analysis and breaker and relay coordination study to show that breaker failure to interrupt the fault on one 4.16 kV bus did not affect the redundant 4.16 kV bus.

The team determined that the finding did not have a cross-cutting aspect because this performance deficiency was not indicative of Dominion's current performance. The team noted that this error existed since the issuance of Revision 1 of the calculation in January 2009.

Enforcement. The team identified a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," which states, in part, measures shall be established to assure that

applicable regulatory requirements and the design basis are correctly translated into specification, drawings, procedures, and instructions. These measures shall include provisions to assure that appropriate quality standards are specified and included in design documents and that deviations from such standards are controlled. The design control measures shall provide for verifying or checking the adequacy of design, such as by the use of alternate or simplified calculational methods. Contrary to the above, between January 2009 and April 15, 2015, calculation MP2-ENG-ETAP-04014E2 did not evaluate the circuit breaker interrupting capability in accordance with IEEE/ANSI C37 series standards. Specifically, Dominion did not assume correct voltage at the 4.16 kV bus and did not include a case where the EDG was synchronized parallel with the bus which resulted in an inadequate evaluation of the 4kv bus and circuit breaker design which resulted in lower fault current being analysed. Dominion revised the calculation during the inspection. Because the finding was of very low safety significance and has been entered into Dominion's corrective action program (CR 576783), this violation is being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000336/2015007-01, Inadequate Evaluation of Circuit Breaker Interrupting Capability)**

.2.1.8 Unit 2 480 Volt Bus (22E)

a. Inspection Scope

The team inspected the 480 Vac vital bus, 22E, to determine whether it was capable of performing its design basis function. The team reviewed the UFSAR, DBDs and electrical distribution calculations including load flow, voltage drop, short-circuit, and electrical protection coordination. This review evaluated the adequacy and appropriateness of design assumptions, evaluated if bus capacity was exceeded and determined whether bus voltages remained above minimum acceptable values under design basis conditions. The team reviewed the electrical overcurrent protective relay settings for the supply and selected breakers at the load center to verify that the trip set points would not interfere with the ability of supplied equipment to perform their safety function yet ensuring the trip set points provided for adequate load center protection. The control logic design drawings of the 4kV supply breaker to vital bus 22E were reviewed to verify adequate breaker closing and opening circuit interlocks. Additionally, the team reviewed system maintenance test results, interviewed system engineers, and conducted field walkdowns to verify that equipment alignment, nameplate data, and breaker positions were consistent with design drawings and to assess the material condition of the bus. Finally, the team reviewed corrective action documents and system health reports to determine whether there were any adverse operating trends and to assess Dominion's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.9 Unit 2, 4kV to 480V transformer (24C1-1X)

a. Inspection Scope

The team inspected the 4160 Vac to 480 Vac transformer, 24C1-1X, to determine whether it was capable of performing its design basis function. The team reviewed the system one-line diagram, nameplate data, and design basis descriptions to verify that the loadings on 480 Vac substation transformer and the associated 4160 Vac and 480 Vac circuit breakers were within the corresponding transformer and switchgear design ratings. The team reviewed the design assumptions and calculations related to the short-circuit currents, voltage drops, and protective relay settings associated with the equipment to determine whether the output voltage was adequate and the settings were appropriate to meet design requirements. The team also reviewed a sample of completed maintenance activities and test results to evaluate if the high and low voltage cable feeders had sufficient capacity to supply the current and voltage requirements of the 480 Vac substation during normal and accident conditions. Finally, the team reviewed corrective action documents and system health reports, and interviewed system and design engineers to determine whether there were any adverse operating trends or existing issues affecting bus reliability and to assess Dominion's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.10 Unit 2, Inverter 2 (3VDA-INV2)

a. Inspection Scope

The team inspected the 120 Vac vital inverter, 3VDA-INV2, to determine whether it was capable of performing its design basis function. The team reviewed the system loading documentation to determine the design basis for maximum load and evaluated if the inverter vendor ratings were adequate to meet the design basis requirements. The team also reviewed calculations to evaluate whether the inverter provided the 120 Vac system loads with adequate voltage for design basis conditions. The team reviewed the operating and surveillance procedures to verify 120 Vac system voltage limits were correctly incorporated. Additionally, the team reviewed the inverter qualification testing to evaluate if component breakers provided for adequate clearing for the 120 Vac system branch circuits during fault conditions. The team completed a walkdown to assess the inverters material condition and to evaluate if the installation was in accordance with manufacturer instructions. Finally, the team reviewed corrective action documents and system health reports, and interviewed system and design engineers to determine whether there were any adverse operating trends or existing issues affecting the busses reliability and to assess Dominion's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.11 Unit 3, Service Water Motor-Operated Valve (MOV-71A)

a. Inspection Scope

The team inspected the SW valve, MOV-71A, to determine if it was capable of performing its design basis functions. Specifically, the team determined if the valve would reposition to isolate the turbine plant closed cooling water system, as required upon receipt of an engineered safety features actuation signal, to ensure adequate flow was available to the SW system. The team reviewed the UFSAR, TSs, TS Bases, and the IST basis documents to identify the design basis requirements of the valve. The team also reviewed periodic motor-operated valve (MOV) diagnostic test results and stroke-timing test data to verify acceptance criteria were met. The team evaluated whether the MOV safety functions, performance capability, and design margins were adequately monitored and maintained in accordance with NRC Generic Letter 96-05 guidance. The team reviewed the MOV weak link calculation to ensure the ability of the valve to remain structurally functional while stroking under design basis conditions. The team verified that the valve analysis used the maximum differential pressure expected across the valve during worst case operating conditions. Additionally, the team reviewed motor data, degraded voltage conditions, and voltage drop calculation results to confirm that the MOV would have sufficient voltage and power available to perform its safety function at degraded voltage conditions. The team discussed the design, operation, and component history of the valve with engineering and operations staff and conducted a walkdown of the valve to assess its material condition of the valve and determine if the installed configuration was consistent with plant drawings, procedures, and the design basis. Finally, the team reviewed corrective action documents and system health reports to determine whether there were any adverse operating trends and to assess Dominion's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.12 Unit 3, “A” Recirculation Spray Pump (3RSS*P1A)

a. Inspection Scope

The team inspected the “A” containment recirculation spray system (RSS) pump, 3RSS*P1A, to determine whether it was capable of meeting its design basis function. The team reviewed calculations, operating procedures, test procedures, recent pump test results, and interviewed system and design engineers in order to evaluate the capability of the RSS pump to perform its required function under limiting operating conditions. The team also reviewed minimum and maximum flow calculations, as well as NPSH and vortex calculations to determine the adequacy of the pump’s suction sources. The team reviewed system operating procedures to ensure they were consistent with the design requirements. The team also reviewed pump IST procedures, test results, and trends in test data to evaluate pump performance. Additionally, IST acceptance criteria were reviewed to verify appropriate correlation to accident analyses requirements. The team reviewed the TS requirements associated with the recirculation spray pump and verified

test results met TS requirements. The team reviewed motor data, degraded voltage conditions, and associated voltage drop calculation to determine whether the pump motor would have sufficient voltage available to perform the intended safety function at degraded voltage conditions. Finally, the team performed a walkdown of the pump and associated equipment, interviewed station personnel, and reviewed recent CRs, system health reports, and maintenance history to determine the overall condition of the pump, whether there were any adverse operating trends, and to assess Dominion's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.13 Unit 3, “B” Motor Driven Auxiliary Feedwater Pump (AFW-P9B)

a. Inspection Scope

The team inspected the “B” motor-driven AFW pump, AFW-P9B, to determine if it was capable of meeting its design basis functions. Specifically, the team evaluated whether the pump was capable of providing adequate flow to the steam generators during DBAs. The team reviewed the AFW system hydraulic model and the design basis hydraulic analysis/calculations to verify that required total developed head (TDH), NPSH, and pump run-out conditions had been properly evaluated under all DBA conditions. The team reviewed system operating procedures to ensure they were consistent with the design requirements. The team also reviewed pump IST procedures, test results, and trends in test data to determine if pump performance was consistent with design basis assumptions and verified IST acceptance criteria were appropriately correlated to accident analyses requirements. Seismic design documentation was reviewed to evaluate whether pump design was consistent with limiting seismic conditions. Additionally, the motor data, degraded voltage conditions, and voltage drop calculation results were reviewed to confirm that the pump motor would have sufficient voltage and power available to perform the intended safety function at degraded voltage conditions. The team also conducted a detailed walkdown of the pump and support systems to determine the material condition of the components and to ensure adequate configuration control. Finally, the team reviewed corrective action documents and system health reports to evaluate whether there were any adverse operating trends and to assess Dominion's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.14 Unit 3. Demineralized Water Storage Tank (3FWA-TK1)

a. Inspection Scope

The team inspected the demineralized water storage tank (DWST), 3FWA-TK1, to determine if it was capable of meeting its design basis function. Specifically, the team evaluated whether the tank was adequately designed to provide the required quantity of water during design basis events. The team reviewed the design, testing, inspection, and operation of the DWST and associated tank level instruments to evaluate whether the tank could perform its design basis function as the water source for the AFW pumps. Specifically, the team reviewed design calculations, drawings, and vendor specifications (including tank sizing and level uncertainty analysis, and pump vortex calculations) to evaluate the adequacy and appropriateness of design assumptions and operating limits. Seismic design documents were reviewed to evaluate whether DWST design assumptions were consistent with limiting seismic conditions. The team interviewed system and design engineers, reviewed instrument test records, and tank inspection results to determine whether maintenance and testing was adequate to ensure reliable operation. Additionally, the review evaluated whether those activities were performed in accordance with regulatory requirements, industry standards, and vendor recommendations. The team also interviewed system and design engineers and conducted a walkdown of the tank area to assess the material condition of the DWST and associated instrumentation. Finally, the team reviewed corrective action documents and system health reports to determine whether there were any adverse operating trends and to assess Dominion's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.15 Unit 3, “A” Service Water Pump (3-SWP-P1A)

a. Inspection Scope

The team inspected the “A” SW pump, 3-SWP-P1A, to determine whether the pump was capable of performing its design basis function. Specifically, the team evaluated whether the pump could provide an adequate supply of cooling water flow to safety-related components during abnormal and accident conditions. Additionally, the team evaluated the ability of the system to respond to several beyond DBAs credited in Millstone’s risk analysis. The team assessed the system hydraulic calculations to ensure the pump provided adequate cooling to safety-related components. The team also verified that design requirements for flow and pressure were properly translated into IST acceptance criteria and evaluated pump IST performance to determine if there was any degradation in pump performance. Seismic design documentation was reviewed to determine whether pump design was consistent with limiting seismic conditions. The team reviewed the SW pump submergence requirements and available submergence to ensure the pump was capable of fulfilling its safety function at the maximum flowrate assumed and lowest intake level. The team also reviewed design documentation to verify pump motor design was consistent with limiting environmental conditions and evaluate the required

capacity for the brake horsepower required by the pump to determine if the pump motor would operate as required. In addition the team reviewed the 4160 Vac system load flow calculation to confirm adequate voltage would be available at the motor terminals during operation. The inspectors also reviewed the motor overcurrent relay setting calculation, relay settings, and recent overcurrent relay calibration tests to evaluate whether the protective relays would provide for reliable motor operation at design basis minimum voltage conditions. The team conducted a detailed walkdown of the pump and discussed the SW pump operation and performance with the engineering staff to assess the material and environmental conditions, and to verify that the installed configuration was consistent with system drawings, and the design and licensing bases. Finally, the team reviewed corrective action documents and system health reports to determine whether there were any adverse operating trends and to assess Dominion's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.16 Unit 3, “B” Safety Injection Pump (3SIH*P1B)

a. Inspection Scope

The team inspected the “B” high head safety injection pump, 3SIH*P1B, to determine if it was capable of performing its design basis function. Specifically, the team assessed the ability of the pump to provide required system head and flow requirements for injection into the reactor coolant system during design basis events through the review of the UFSAR, drawings, DBDs, and procedures. The team determined whether design inputs were properly translated into system procedures and tests, and reviewed completed surveillance tests to determine if the results adequately demonstrated pump operability. Additionally, the motor data, degraded voltage conditions, and voltage drop calculation results were reviewed to confirm that the pump motor would have sufficient voltage and power available to perform its safety function at degraded voltage conditions. The team also reviewed the adequacy of water supply sources to the pump including an assessment of the potential for vortex conditions. The team also performed field walkdowns and interviewed system engineers and operators to assess the material condition of the pump and supporting equipment as well as the capability to implement design basis event procedures. Finally, the team reviewed corrective action documents and system health reports to determine whether there were any adverse operating trends and to assess Dominion's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.17 Unit 3, “C” Charging Pump (3CHS*P3C)

a. Inspection Scope

The team inspected the “C” charging pump, 3CHS*P3C, to determine whether it was capable of performing its design basis function. Specifically, the team assessed the ability of the pump to provide required system head and flow requirements for injection into the reactor coolant system during normal operation and design basis events through the review of the UFSAR, drawings, DBDs, and procedures. The team reviewed a sample of surveillance test results to verify that pump performance met the acceptance criteria and to ensure that the acceptance criteria were consistent with the design basis. The team reviewed calculations for suction resource vortexing during design basis injection conditions as well as NPSH requirements and post modification testing analyses associated with pump rotating element replacement. The team discussed the design, operation, and corrective maintenance of the pump with engineering and operations staff as well as performed a walkdown of the pump to gain an understanding of the capability of the site to implement normal, abnormal, and emergency operating procedures, component performance history, and overall component health. Finally, the team reviewed corrective action program entries, maintenance activities, and system health reports to determine whether there were any adverse operating trends and to assess Dominion's ability to identify, correct, and prevent equipment reliability concerns.

b. Findings

No findings were identified.

.2.1.18 Unit 3, “B” Emergency Diesel Generator – Electrical (3B)

a. Inspection Scope

The team inspected the “B” EDG 3B to determine whether it was capable of meeting its design basis function. Specifically, the team reviewed calculations for both static and transient loading to determine whether the EDG had sufficient capacity and capability to supply the required accident loads. The team reviewed one-line diagrams for the EDG, the vendor manuals, nameplate rating data, and the EDG load study to ensure that the EDG was operated consistent with its rating and capable of operating under the worst case design basis loading conditions. The team also reviewed the generator electrical protective relaying scheme including drawings, calculations, calibration records, and procedures to determine whether the generator was adequately protected and whether its output breaker was subject to spurious tripping. Additionally, the team reviewed maintenance schedules, procedures, and completed work records to determine whether the EDG was being properly maintained and reviewed completed surveillances to determine whether the diesel was being tested in accordance with the TSs. The team reviewed the design and testing of the EDG sequencer, confirmed the accident loading of the EDG was within the EDG rating, and reviewed the interlocks and sequence timing to confirm they were correctly represented on the control schematics of the selected safety-related pumps. The team also interviewed station engineers and performed walkdowns of the Unit 3 EDGs to assess the material condition of equipment. Finally, the

team reviewed corrective action documents and system health reports to determine whether there were any adverse operating trends and to assess Dominion's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.19 Unit 3, 480 Volt Bus 32R Transformer (34D4-1X)

a. Inspection Scope

The team inspected the 4160-480 Vac transformer, 34D4-1X, to determine whether it was capable of meeting its design basis function. Specifically, the team evaluated if the transformer had adequate capability to provide required power to supplied 480 volt bus and associated equipment. The team reviewed load calculations to determine the design basis maximum load and reviewed the bus load center equipment vendor ratings to ensure they were in conformance with the design basis. The team reviewed surveillance tests to verify the acceptance criteria satisfied design basis load requirements and transformer protection settings. The team also reviewed the coordination/protection calculation for the transformer incoming line and load side breakers for design basis load flow conditions and transformer protection and coordination to ensure breaker set points were adequate to protection equipment and to ensure that the spurious tripping did not occur. Additionally, the team interviewed plant engineers and performed a walkdown of the transformer to assess the material condition of the equipment. Finally, the team reviewed corrective action documents and system health reports to determine whether there were any adverse operating trends and to assess Dominion's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.20 Unit 3, 480 Volt Vital Load Center (32T)

a. Inspection Scope

The team inspected the 480 Vac vital load center, 32T, to determine whether it was capable of performing its design basis function. The team reviewed electrical distribution calculations including load flow, voltage drop, short-circuit, and electrical protection coordination. This review evaluated the adequacy and appropriateness of design assumptions, determined whether load center capacity was exceeded, and evaluated if voltages remained above minimum acceptable values under design basis conditions. The team reviewed the electrical overcurrent protective relay settings for the supply and selected breakers at the load center to verify that the trip set points would not interfere with the ability of supplied equipment to perform their safety function yet provide for adequate load center protection. The team also reviewed system maintenance test results, interviewed system and design engineers, and conducted field walkdowns to

verify that equipment alignment, nameplate data, and breaker positions were consistent with design drawings and to assess the material condition of the load center. Finally, the team reviewed corrective action documents and system health reports, and interviewed system and design engineers to determine whether there were any adverse operating trends or existing issues affecting the busses reliability and to assess Dominion's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.2 Review of Industry Operating Experience and Generic Issues (5 samples)

The team reviewed selected OE issues for applicability at the Millstone Power Station. The team performed a detailed review of the OE issues listed below to verify that Dominion had appropriately assessed potential applicability to site equipment and initiated corrective actions when necessary.

.2.2.1 NRC Information Notice 2009-10, Transformer Failures - Recent Operating Experience

a. Inspection Scope

The team reviewed Dominion's response to NRC Information Notice (IN) 2009-10, "Transformer Failures - Recent Operating Experience" and found the site was not aware of this specific IN. However, the team noted that Dominion had already replaced all the large power transformers on Unit 2 and the main transformer on Unit 3. Replacement of the remaining large power transformers at Unit 3 were in the site's long term plans.

b. Findings

No findings were identified.

.2.2.2 NRC Information Notice 2012-01, Seismic Considerations - Principally Issues Involving Tanks

a. Inspection Scope

The team assessed Dominion's applicability review and disposition of NRC IN 2012-01, "Seismic Considerations – Principally Issues Involving Tanks." The IN was issued to inform licensees of operating experience related to inadequate seismic analyses of safety related tanks associated with stored inventory and interaction with non-seismic systems, structures, or components. The team interviewed station engineers and performance improvement group staff and reviewed operating experience program administrative guidance and corrective action program entries concerning the implementation of the operating experience program to determine Dominion's expectations and standards for the evaluation and mitigation potential vulnerabilities identified via external operating experience. The team interviewed station engineers as well as reviewed seismic

analyses and maintenance procedures for safety related tanks to assess Dominion's response to the seismic to non-seismic concerns identified in the IN.

b. Findings

No findings were identified.

.2.2.3 NRC Information Notice 2012-14, Motor-Operated Valve Inoperable Due to Stem-Disc Separation

a. Inspection Scope

The team reviewed Dominion's response to NRC IN 2012-14, "Motor-Operated Valve Inoperable Due to Stem-Disc Separation." This notice informed licensees about operating experience involving an MOV that failed at the connection between the valve stem and disc and the NRC's expectations regarding licensee actions/programs to ensure the completeness of operability determinations for MOVs. The team reviewed Dominion's applicability review and disposition of NRC IN 2012-14 and the MOV and IST Programs at Millstone, as they related the issues identified in this IN. The team reviewed the associated corrective action program document, CR 521814, which addressed questions regarding the incorporation of Joint Owner's Group threshold valve factors in determining the operability of MOVs and discussed the bases for valve factors implemented at Millstone. The team also reviewed Millstone's test program to verify conformance with testing requirements and reviewed IST procedures to assess the adequacy of methods for accurately determining valve functionality. Finally, the team reviewed actions during the inspection that addressed how weaknesses in documenting the adequacy of their IST procedures review were addressed.

b. Findings

No findings were identified.

.2.2.4 NRC Information Notice 2013-05, Battery Expected Life and Its Potential Impact on Surveillance Requirements

a. Inspection Scope

The team reviewed Dominion's response to NRC IN 2013-05, "Battery Expected Life and its Potential Impact on Surveillance Requirements." The NRC issued this IN to inform the licensees about issues involving licensee's nonconservative technical specifications regarding surveillance requirements for direct current (DC) power systems due to reduction in battery life. The team reviewed Dominion's response and associated documents that were used to disposition this IN. Specifically, the team reviewed Dominion's battery sizing calculations and verified that the calculation used correct aging factor of 1.25 in accordance with IEEE 485 standard. This aging factor ensures that frequencies for performing TS surveillances, specifically those associated with

performance and modified performance discharge testing, are conservative when batteries reach 85 percent of expected life.

b. Findings

No findings were identified.

.2.2.5 NRC Information Notice 2012-06, Ineffective Use of Vendor Technical Recommendations

a. Inspection Scope

The team reviewed Dominion's response to NRC IN 2012-06, "Ineffective Use of Vendor Technical Recommendations." This notice informed licensees about operating experience regarding ineffective use of vendor technical recommendations. The team reviewed Dominion's disposition of NRC IN 2012-06 by evaluating Dominion's associated corrective action program document, OEE001481. Additionally, the team evaluated the actions to address performance gaps in their program identified by Dominion's following their review of the IN. In addition, the team selected specific vendor communications/updates to determine whether the updates were appropriately reviewed and incorporated into the required document (e.g., vendor manual, station procedures, etc.).

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems (IP 71152)

a. Inspection Scope

The team reviewed a sample of problems that Dominion had previously identified and entered into the corrective action program. The team reviewed these issues to verify an appropriate threshold for identifying issues and to evaluate the effectiveness of corrective actions. In addition, CR written on issues identified during the inspection, were reviewed to verify adequate problem identification and incorporation of the problem into the corrective action system. The specific corrective action documents that were sampled and reviewed by the team are listed in the Attachment.

b. Findings

No findings were identified.

4OA6 Meetings, including Exit

On May 1, 2015, the team presented the inspection results to Mr. John Daugherty, Site Vice President, and other members of the Millstone Power Station staff. The team reviewed proprietary information, which was returned to Dominion at the end of the inspection. The team verified that no proprietary information was documented in the report.

ATTACHMENT

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Dominion Personnel
D. Dougherty, System Engineer
D. Lowell, System Engineer
D. MacNeill, Engineering Supervisor
D. Russo, System Engineer
D. Scott, System Engineer
H. Williamson, Unit 2 Shift Manager Operations
J. Barile, System Engineer
J. Daugherty, Vice President
J. Plourde, System Engineer
J. Price, Supervisor Mechanical Maintenance
K. Deslandes, Design Engineering Supervisor
K. Wallace, System Engineer
L. Salyards, Licensing Engineer
J. Powers, Engineering
L. Loomis, System Engineer
M. Fiala, System Engineer
M. Legg, Corporate Mechanical Engineer,
M. Marino, Corporate Mechanical Engineering Supervisor
M. Vezina, System Engineer
P. Amdola, Seismic Engineer
R. Acquaro, Shift Manager
R. Deconto, Consulting Engineer
R. Patel, Design Engineer
R. Shauffler, Corporate Mechanical Engineer
R. Van Steengergen, MOV Program Owner
S. Saulter, Mechanical Maintenance Technician
S. Smith, Manager Operations
S. Stanley, Director of Nuclear Engineering
T. Cleary, Licensing Engineer
T. Perkins, Unit 2 Unit Supervisor Operations
W. Chestnutt, Unit 2 Supervisor Nuclear Shift Operations
W. Saputo, System Engineer

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Open and Closed

05000336/2015007-01	NCV	Reactor Building Closed Cooling Water System Pump Oil Leakage Results in Technical Specification Inoperability (Section 1R21.2.1.5)
05000336/411/2015007-02	SLIV	Failure to Provide 10 CFR 50.59 Evaluation for Interim Action Associated with Implementation of Operability Determination Procedure (Section 1R21.2.1.5)
05000336/2015007-023	NCV	Inadequate Evaluation of Circuit Breaker Interrupting Capability (Section 1R21.2.1.7)

LIST OF DOCUMENTS REVIEWED

Calculations & Engineering Evaluations

00-059, MP3 SW System NPSH Evaluation, Revision 1
02-0600, MP3 PM Change Request (RSS Pumps), Revision 0
03705-US(B)-359, Recirculation Spray Pump Performance, Revision 0
03705-US(B)-361, Containment RSS and SI System Hydraulic Analysis, Revision 3
07077-US(B)-002, Maximum Containment Water Level During LOCA, Revision 0
08-ENG-04393M3, AFW System, NPSH Margin Given Pump Suction Alignment to CST, Revision 0
12179-526, Stress Analysis of Demineralized Water Storage Tank, Revision 1
12179-HYD-H39, Design of Vortex Suppressor for the QSS Tank QSS*TK1, Revision 1
12179-NM(B)-534-IE, Millstone Unit 3 Refueling Water Storage Tank Design and Analysis, Revision 1, and Change Notice 1, Revision 1 and Change Notice 2, Revision 1
12-ENG-04355M2, HPSI Pump Comprehensive IST Acceptance Criteria, Revision 0
151E, Panel Loading for Class 1E and Non-Class 1E Channels 1-4, Revision 01
178E, 5 kV and 8 kV Power Cable Temperature under Fault Conditions, Revision 2
183E, Effect of Sil-Temp Wrap on Cable Ampacity, dated 10/04/1985
195E, Verify Cable Selection for 9.9 kV and 4.16 kV Loads, dated 8/27/85
211E, Voltage Verification for 120V Vital bus Circuits Class 1E, Revision 01
25203-ER-98-0103, Design Inputs for MP2 ECCS System Analysis, Revision 0
84-065-00753GE, 480V Breaker Overcurrent Trip Device, Revision 2
90-094-01076M3, Target Thrust Torque for 3SWP*MOV71A, 3SWP*MOV71B, Revision 5
91-004-288E2, Primary Penetration Protection Study (Unit 2), Revision 00, Changes 1- 6, 8
92-030-1311E2, Emergency Bus Undervoltage Setpoint Analysis, Revision 1
92-079, NPSH Requirements and NPSH Available for MP2 SWS Pumps, Revision 1
93C2799-C-008, Millstone Unit 2 Seismic Capacity of Refueling Water Storage Tank, Revision 0
94103-C-08, Weak Link Seismic Assessment for MOVs 3SWP*MOV71A/B, Revision 3
96-001, Empirical Adjustment of MP3 SW Model to 1995 Flow Test Data, Revision 3
96-067, Aux. Feedwater System Comprehensive Flow Analysis, Revision 3
97-120, MP2 CAR Unit Performance with Design Fouling, Revision B

97-CAR-01916M2, Containment Air Recirculation System Original Design Data, Revision 0
97-CAR-01917M2, Containment Air Recirculation System, Air Flow Rate and Throw Distance through Fusible Link Plates, Revision 0
97-ENG-01774-E2, Battery Sizing, Revision 2
97-ENG-01912E2, Millstone Unit 2 4.16 Switchgear Relay Settings, Revision 0, Change 4, through Addendum 23
98-ENG-02568M2, RBCCW Pump Acceptance Curve for TS Section 4.7.3.1, Revision 01
C14.1460, Lateral Supports for Service Water Pumps, Revision 0
CN-TA-06-101, Millstone Unit 3 SPU Program IGOR/RETRAN Base Deck, Revision 1
DM2 00-0200-09, Temporary Credit for Local Manual Action Outside Control Room, RWST Purification Subsystem, dated 5/17/12
DM2-00-0135-09, New O/C Relay for P41A/B/C Motors
DM2-01-0135-09, Move Test Point for New O/C Relay for P41A/B/C Motors
DM3-00-0127-08, Power Uprate Effect on RCP Operation
DM3-00-0206-09, MCC Starter Replacement, dated 7/21/10
DM3-02-0983-97, Addition of New Drawing for Orifice Plates 3RSS*RO40A-D, dated 3/6/98
ENG 97-122, ECCS System Analysis, Revision 3
ETE-CEE-2014-1006, MPS3 Auxiliary Feedwater Pump Quarterly and Comprehensive IST Flow Test Requirements, Revision 0
ETE-CME-2014-1010, MP3, 'A' Service Water Pump Performance Evaluation Based on Data from SPROC OPS14-3-001, Revision 107
ENG-01912E2, Millstone Unit 2 4.16 KV Switchgear Relay Settings, Revision 0
GSI-191-ECCS-04150M3, Post-LOCA Transport Evaluation for GSI-191 Resolution, Revision 1
GSI-191-ECCS-04162M2, Post LOCA Debris Transport Evaluation, Revision 1
GSI-191-ECCS-04364M3, RSS Pump NPSH with ECCS Strainer and Debris Bed, Revision 1
M22502022-01643-C2, Calculation for RWST Pipe Support 5-2-22, Revision 0
M3-05003, Replacement of ECCS Sump Strainer per Generic Letter 2004-02, Revision 0
M3-06006, Unit 3 Vital Inverters Replacement, Revision 0
M3-98-008, Containment Recirculation Pump Pressure Drop at Inboard Seal Cavity, Revision 1
MIL2-34325-AR-001, Hydraulic Performance of Containment Sump Strainers, Revision 1
MP2-ENG-ETAP-04014E2, MP2 Electrical Distribution System Analysis, Revision 3
MP3-12-01171, Millstone Unit 3 BDB Integrated FLEX Strategy, Electrical Connection, Revision 008
MP3-CALC-ENG-067R, Maximum Cable Lengths for Continuous Duty Motors, Revision 1
MP3-CALC-ENG-195E, Unit 3 Verification of Cable Size for 6.9 and 4.16 kV Loads, Revision 1
MP3-CALC-ENG-195R, Unit 3 Verification of Cable Size for 6.9 and 4.16 kV Loads, Revision 0
MP3-ENG-ETAP-04125E2, MP3 Electrical Distribution System Analysis, Revision 3
MP3-ENG-ETAP-04125E3, MP3 Electrical Distribution System Analysis, Revision 0
MP3-ENG-ETAP-04125E3, MP3 Electrical Distribution System Analysis, Revision 0
NL-033, Millstone 3 Emergency Generator Loading & Starting KVA, dated 3/19/2015
NL-035, 480 V Emergency Load Center Bus Tie Cable Ratings, Revision 0
NSP-098-FWA, DWST Level Setpoint and Loop Uncertainty, Revision 2
PA84-065-753GE, AC 480 V Load Center 22E/22F Relay Settings, Revision 2
S-M2CNT-04325S2, Gothic Containment Analysis Models for MP2, Revision 0
SP-M3-EE-10118, MP3 Vital Inverter System Replacement, Revision 008-01
SP-M3-EE-321, Control of Electrical Setpoints, Revision 02
US(B)-294, NPSH Available for ECCS Pumps, Revision 6
US(B)-295, RWST Draw-Down Rates and Switchover Levels, Revision 8

W3-517-981RE, Millstone 3 Emergency Operating Procedure (EOP) Setpoint Documentation, Revision 9
U3-M3-E-0333, Specification for Millstone Unit 3 - Environmental Conditions for Equipment Qualification, Revision 8

Corrective Action Condition Reports

M3-98-0264	576658*	564871	541482	473152
578418*	576653*	564728	539885	461213
578186*	576586*	564534	533729	455671
578094*	576087*	564145	527366	448364
578021	575949	564063	522948	446274
577964*	575859*	562815	521814	438997
577517	575795	562524	515688	435062
577352	575715	561251	515402	433907
576963*	575386	555200	512399	425265
576954*	574885	553357	512342	422481
576894*	574298	552620	507496	417346
576849*	571810	546641	506375	411945
576783*	570890	546553	505514	322563
576769	569843	546392	492266	242390
576681	567464	546145	484281	08-01442
576672*	566235	545333	483716	001481
576668*	565930	543044	479997	
576660*	565623	542534	477001	

* CR written as a result of this inspection

Design and Licensing Basis Documents

25212-MP3-SFR, Millstone Unit 3 Safety Functional Requirements Manual, Revision 6
3DBS-BOP-001, Design Basis Summary for MP3 Service Water System, Revision 2
3DBS-NSS-003, Design Basis Summary for the Containment RSS, Revision 1
DBS-2308, High Pressure Safety Injection System, Revision 1
DBS-2326A, Design Basis Summary - Service Water System, Revision 1
DBS-2330A, Design Bases Summary - Reactor Building CCW System, Revision 0
DCR M3-07001, MP3 A & C Charging Pump Rotating Assembly Replacement, dated 10/22/10
DBS-NSS-001, Design Bases Summary - AFW System, Revision 1
DBS-2313A, Design Bases Summary - Containment Air Recirculation and Cooling System, Revision 0
DBS-BOP-001, Design Bases Summary - Service Water System, Revision 2
DM3-00-0015-08, Addition of Vent Valve Upstream of Valve 3SIH*MV8835, dated 5/27/07
EQR 113-01, Equipment Qualification Record RBCCW Pumps, Revision 5
EQR 115-4-1, Millstone Unit 3 Equipment Qualification Record Charging Pumps, Revision 1
M3-EV-07-0036, New Design Information for MP3 Charging Pump (CHS*P3C) Rotating Assembly Upgrades, dated 10/22/10
Millstone Unit 2 Technical Specifications, dated 4/18/14
Millstone Unit 2 Updated Final Safety Analysis Report, Revision 32
Millstone Unit 3 Technical Specifications, dated 7/11/14
Millstone Unit 3 Updated Final Safety Analysis Report, Revision 27.2

U2-IST-ISTBDM, MP2 IST Basis Document, Revision 4
U3-24-IST-ISTBD, MP3 IST Basis Document, Revision 3-14-001

Drawings
1201170-E-25203-30001-A, Main Single Line Diagram, Revision 0
1201170-E-25203-30001-B, Main Single Line Diagram, Revision 0
1201171-E-25212-300001, MP3 Main One Line / Phasing Diagram, Revision 0
12179-EC-30F, Demineralized Water Storage Tank, Foundation Yard Tankage, Revision 7
12179-EC-14T, Outline CW Pump House, Revision 6
12179-EM-8B, Circ and Service Water Pump House, Revision 11
25212-20406, Sht. 1, Containment Recirculation Pump 3RSS*P1A Seal Piping, Revision 2
25203-24014, Containment Ventilation, Revision 2
25212-25031, Sht. 1, Yard Piping, Revision 8
D-74-413, Richmond Engineering Company Demineralized Water Storage Tank, Revision 14
25212-30004, Main One Line Diagram 4160 Norm & Emergency Buses, Revision 20
25203-30108, Sht. 5, Millstone Unit #2 4160V System Relay Settings, Revision 3
25203-26005, Sht. 3, Condensate Storage and AFW, Revision 60
25203-26011, Sht. 1, Fire Protection, Revision 57
25203-26008, Sht. 3, Service Water to Vital AC Switchgear Cooling Coil and AC Chillers, Revision 33
25203-26008, Sht. 2, Piping & Instrument Diagram Service Water, Revision 113
25203-26015, Sht. 2, High Pressure Safety Injection Pumps, Revision 46
25203-26015, Sht. 1, Low Pressure Safety Injection System, Revision 45
25203-26022, Sht. 3, RBCCW System Containment Spray Pump and Safety Injection Pump Seal Coolers, Revision 14
25203-26022, Sht. 2, RBCCW System Spent Fuel Pool and Shut-down Heat Exchangers, Revision 26
25203-26022, Sht. 1, RBCCW System RBCCW Pumps and Heat Exchangers, Revision 45
25203-26022, Reactor Building Closed Cooling Water System Containment Air Recirculation and Coolant Unit, Revision 27
25203-26028, Containment and Enclosure Building Ventilation, Revision 47
25212-26933, Sht. 2, Service Water, Revision 89
25212-26904, Sht. 1, Chemical and Volume Control, Revision 54
25212-26904, Sht. 4, Chemical & Volume Control, Revision 30
25212-26930, , Feedwater System, Revision 48
25212-26933, Sht. 4, Service Water, Revision 45
25212-26904, Sht. 1, Chemical and Volume Control, Revision 54
25212-26905, Sht. 1, Charging Pump Sealing and Lubrication, Revision 23
25212-26916, Sht. 4, EDG “B” Starting Air System, Revision 7
25212-26912, Sht. 1, 2 and 3, Low Pressure Safety Injection, Revision 50, 23 and 38
25212-26913, Sht. 2, High Pressure Safety Injection, Revision 41
25212-26911, Fuel Pool Cooling & Purification System, Revision 37
25212-26913, Sht. 1, High Pressure Safety Injection, Revision 32
25212-26916, Sht. 3, Emergency Diesel Generator “B” Starting Air System, Revision 20
25212-26914, Sht. 1, Safety Injection Pump and Neutron Shield Tank Cooling Systems, Revision 18
25212-26915, Sht. 1, Quench Spray and Hydrogen Recombiners, Revision 37

25203-28108, Sht. 26, Logic Diag.-Diesel Gen. Cooling Water Heater Exch. Supply & Bypass Valves, Revision 8
25203-28115, Sht. 22, Pump Recirculation Header Stop Valves, Revision 3
25203-28150, Sht. 1, Engineered Safety Logic, Revision 9
25203-28150, Sht. 3, Engineered Safety Logic Sequencer, Revision 6
25203-28150, Sht. 2B, Engineered Safety Logic, Actuated Equipment Tabulation, Revision 6
25212-28457, Sht. 11, Logic Diagram Containment Recirculation, Revision 11
25212-28457, Sht. 10, Logic Diagram Containment Recirculation, Revision 11
25212-29004, Sht. 11, Hayward Tyler 24 VSN Vertical Pump, Revision N
25212-29023, Sht. 1, Refueling Water Storage Tank, Revision 24
25212-29023, Demineralized Water Storage Tank, Revision 21
25212-29044, Sht. 19, Tandem Package Shaft Seal, Revision E
25212-29041, Motor Driven Aux. Feedwater Pump, Revision H
25203-29126, Sht. 28, Pressure Relief Damper, Revision A
25212-29190, Sht. 24, Orifice Plates, RSS Pump Discharge, Revision A
25212-30078, 125 VDC One Line Diagram Batteries 308B-1& 301B-2, Revision 33
25212-30047, Sht. 2, 480V MCC One Line Diag Rod Control Area, Revision 49
25203-30052, Sht. 2, Schematic Diagram 480 V Unit Substation 22E (B05), Revision 5
25212-30061, 480 VAC MCC One Line Diagram Control Building, Revision 35
25203-30099, Sht. 23, 480 V Load Center Circuit Breaker Settings, Revision 5
25203-30099, Sht. 20, 480 V Load Center Circuit Breaker Settings, Revision 6
25203-29641, Containment Building HVAC, CAR Fans F14A/B/C/D, Revision 3
25212-30076, One Line Diagram 125VDC &120VAC Distr Sys-Cmpst, Revision 31
25212-30082, 120 VAC One Line Diagram Vital Bus II & IV, Revision 29
25203-30001, Main Single Line Diagram, Revision 40
25203-30005, Single Line Meter & Relay Diagram, Revision 21
25212-30001, Main One Line / Phasing Diagram PWR Distr Sys Composite, Revision 26
25203-30044, Sht. 17, Schematic Diagram 4.16KV Bus 24C, Revision 11
25203-30044, Sht. 16, Schematic Diagram 4.16KV Bus 24C, Revision 8
25203-30044, Sht. 4, Schematic Diagram 4.16KV Bus 24C, Revision 8
25203-30044, Sht. 1, Schematic Diagram 4.16KV Bus 24C, Revision 5
25203-30044, Sht. 3, Schematic Diagram 4.16KV Bus 24C, Revision 2
25203-30044, Sht. 2, Schematic Diagram 4.16KV Bus 24C, Revision 2
25203-30034, Sht. 1, Logic Diagram, Diesel Generator & Diesel Bkr. Control, Revision 13
25212-30241, Sht. 1, Emergency Generator Starting Air System Air Compressor Control, Revision 5
25203-32002, Sht. 56, C Containment Air Recirc Fan F14C, Revision 6
25212-32001, Sht. 5CJ, Service Water Pump 3SW*P1A, Revision 20
25203-32022, Sht. 55, “A” Containment Air Recirc Fan F14A, Revision 6
25203-32003, Sht. 33, Containment Air Recirculation Fan F14A CB 22E6-2, Revision 5
25212-32001, Sht. 5CN, Unit No. 3 CNTMT Recirc Pump, Revision 14 and 17
25212-32001, Sht. 5CU, Unit No. 3 Charging Pump P3C, Revision 14
25212-32001, Sht. 5DK, Safety Injection Pump P1B, Revision 14
25203-32005, Sht. 30, Reserve Station Service Transformer, Revision 7
25212-32001, Sht. 5CV, Charging Pump P3C (Swing), Revision 12
25203-32023, Sht. 42, Vital Switchgear Room Cooling Fan F51, Revision 15
25203-32002, Sht. 14, Millstone Unit 2 4.16 KV Tie Feeder Bkr, Revision 6
25203-32002, Sht. 13, Millstone Unit 2 4.16 KV Tie Feeder Bkr, Revision 6

25203-32002, Sht. 1, 4.16KV Main Feeder Bkr., Revision 12
25203-32002, Sht. 2, 4.16KV Main Feeder Bkr., Revision 11
25212-32001, Sht. 5DY, Millstone Nuclear Power Station - Unit No. 3 Stm Gen Aux Fdwtr PP Mot Driven P1B, Revision 14
25203-32013, Sht. 22, Millstone Unit 2 Diesel Eng. CW Ht. Exch. Supply SV-FV6397 (2-SW-89B) & Bypass Valve SV-FV6342 (2-SW-231B), Revision 13
25203-32008, Sht. 6, Containment Spray Pump P43A, Revision 11
25203-32013, Sht. 5, Service Water Pump P5A, Revision 14
25203-32008, Sht. A, Control Switch Development, Revision 11
25203-32008, Sht. B, Limit Switch Development, Revision 6
25203-32008, Sht. 3, High Pressure Safety Injection Pump P41B, Revision 14
25203-32015, Sht. 3, Reactor Building Closed Cooling Water Pump, Revision 17
25203-32022, Sht. 1, Cnmt. Air Recirc. Fan MF14A Control, Revision 15
25203-39005, Sht. 51A, MCC For Load Center B5, Revision 3
25203-39005, Sht. 51C, Millstone Unit 2 Containment Air Recirculation Fan, Revision 5
25212-39241, Sht. 189, Emergency Generator Load Sequencing, Rev 8
25212-39622, Sht. 65, Schematic 25 KVA Inverter 125VDC 120VAC 1ø 60HZ, dated 5/09/2006
25212-39427, Sht. 127, Sequencer Electrical Schematic, Revision D
25212-39427, Sht. 118, Sequencer Electrical Schematic, Revision B
25212-39427, Sht. 116, Sequencer Electrical Schematic, Revision B
25212-39427, Sht. 106, Sequencer Electrical Schematic, Revision C
B-30869, Seal Piping Schematic, Revision C
25203-211173, Containment Floor Plan, Revision 4
25203-32008, Sht. 54, Minimum Flow Isolation SOV SI659 (2-SI-659), Revision 11

Functional, Surveillance and Modification Acceptance Testing
EN 21063A, Rectangular Duct Traverse Data Sheet, CAR Fan F14A Slow Speed, dated 11/10/12
3622.2-2, Comprehensive pump test results for FWA P1B, performed 11/10/14
SP 3626.3-017, Service Water Train 'A' Valve Position Verification Test, performed 10/28/14
SP 3606.1, RSS Pump 3RSS*P1A Operational Readiness Test, performed 11/2/14
SP 3608.2, Safety Injection Pump B Quarterly IST Pump Test, performed 1/7/15
SP 3604A.4, 3CHS*P3C Biennial IST Comprehensive Pump Test, performed 10/17/14
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MPS-2 C RBCCW Pump and Motor IST Data, from 1/11/11 through 2/23/15
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53M20706137	53M30600960	53102291633	53102343959
53M30707783	53M30804628	53102292008	53102356674
53M30707784	53M30112160	53102292021	53102428628

53102428644	53102477128	53102602203	53102759184
53102431095	53102477811	53102629898	53102763807
53102431419	53102480484	53102630848	53102767039
53102431605	53102497034	53102633000	53102774564
53102468528	53102575801	53102633254	53102780448
53102471726	53102576950	53102638516	53102795379
53102472248	53102586738	53102659590	53102816030
53102475480	53102592183	53102691543	53192431605
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LIST OF ACRONYMS

AC	Alternating Current
ADAMS	Agencywide Documents Access and Management System
AFW	Auxiliary Feedwater
ALARA	As Low As Reasonably Achievable
ANSI	American National Standards Institute
AOV	Air Operated Valve
CAR	Containment Air Recirculation
CCW	Component Cooling Water
CDBI	Component Design Bases Inspection
CFR	Code of Federal Regulations
CR	Condition Report
DBA	Design Basis Accident
DBD	Design Basis Document
DC	Direct Current
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
DWST	Demineralized Water Storage Tank
EDG	Emergency Diesel Generator
HRA	Human Reliability Assessment
IEEE	Institute of Electrical and Electronics Engineers
IMC	Inspection Manual Chapter
IN	Information Notice
IP	Inspection Procedure
IST	In-Service Test
kV	Kilovolt
LCO	Limiting Condition of Operation
LERF	Large Early Release Frequency
LLOCA	Large Break Loss of Coolant Accident
MOV	Motor Operator Valve
NCV	Non-cited Violation
NPSH	Net Positive Suction Head
NRC	Nuclear Regulatory Commission
NSST	Normal Station Service Transformer
OE	Operating Experience
PRA	Probabilistic Risk Assessment

RAW	Risk Achievement Worth
RBCCW	Reactor Building Component Cooling Water
Rem	Roentgen Equivalent Man
RRW	Risk Reduction Worth
RSS	Recirculation Spray System
RSST	Reserve Station Service Transformer
SDP	Significance Determination Process
SLIV	Severity Level IV
SPAR	Standardized Plant Analysis Report
SRA	Senior Reactor Analyst
SSC	Structure, System and Components
SW	Service Water
TDH	Total Dynamic Head
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
Vac	Volts, Alternating Current