

May 13, 2004

EA 04-001

Mr. David A. Christian
Sr. Vice President and Chief Nuclear Officer
Dominion Resources
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION UNIT 2 AND UNIT 3 - NRC INTEGRATED
INSPECTION REPORT 05000336/2004005 AND 05000423/2004005
EXERCISE OF ENFORCEMENT DISCRETION

Dear Mr. Christian:

On March 31, 2004, the U.S. Nuclear Regulatory Commission (NRC) completed inspections at your Millstone Power Station Unit 2 and Unit 3. The enclosed integrated inspection report documents the inspection findings, which were discussed on April 20, 2004 with Mr. J. Alan Price and other members of your staff.

The inspections 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. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents one NRC-identified finding and two self-revealing findings of very low safety significance (Green). Two of these findings were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they have been entered into your corrective action program, the NRC is treating these issues as Non-Cited Violations, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. Additionally, one licensee-identified violation which was determined to be of very low safety significance is listed in this report. If you contest any non-cited violations 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 Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Millstone Power Station.

This report also documents a licensee-identified event at Unit 2 concerning reactor coolant system (RCS) pressure boundary leakage from two pressurizer heater penetrations. This leakage, which was of very low safety significance, was a violation of Millstone Unit 2 Technical Specifications, which prohibits operation in Modes 1 through 4 with RCS pressure boundary leakage. The NRC has reviewed your root cause and corrective actions for this event and concluded that the leakage was not avoidable by the implementation of reasonable quality assurance measures. Therefore, in accordance with Section VII.B.6 of the Enforcement Policy,

I have been authorized, after consultation with the Director, Office of Enforcement, and the Region I Administrator to exercise enforcement discretion and not issue a violation for this leakage.

Since the terrorist attacks on September 11, 2001, NRC has issued five Orders and several threat advisories to licensees of commercial power reactors to strengthen licensee capabilities, improve security force readiness, and enhance controls over access authorization. In addition to applicable baseline inspections, the NRC issued Temporary Instruction 2515/148, "Inspection of Nuclear Reactor Safeguards Interim Compensatory Measures," and its subsequent revision, to audit and inspect licensee implementation of the interim compensatory measures required by order. Phase 1 of TI 2515/148 was completed at all commercial power nuclear power plants during calendar year 2002 and the remaining inspection activities for Millstone Power Station were completed in calendar year 2003. The NRC will continue to monitor overall safeguards and security controls at Millstone.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's document 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/

A. Randolph Blough, Director
Division of Reactor Projects

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

Enclosure: Inspection Report 05000336/2004005 and 05000423/2004005
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.: 05000336, 05000423

License No.: DPR-65, NPF-49

Report No.: 05000336/2004005 and 05000423/2004005

Licensee: Dominion Nuclear Connecticut, Inc.

Facility: Millstone Power Station, Unit 2 and Unit 3

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

Dates: January 1, 2004 - March 31, 2004

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Enclosure

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SUMMARY OF FINDINGS

IR 05000336/2004005, 05000423/2004005; 01/01/2004 - 03/31/2004; Millstone Power Station, Unit 2 and Unit 3; Personnel Performance During Non-Routine Plant Evolutions and Events, Post-Maintenance Testing, and Other Activities.

The report covered a three-month period of inspection by resident inspectors and an announced inspection by a regional inspector. Two (Green) non-cited violations (NCVs), and one (Green) finding were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3 dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Initiating Events

Unit 2

- Green. A self-revealing non-cited violation of Technical Specification (TS) 6.8.1a was identified for the failure to adequately implement procedures for Steam Generator Feed Pump (SGFP) testing which led to a reactor trip. On March 15, 2004, the Unit 2 reactor automatically tripped from 100% power while operators were performing quarterly testing of the "B" SGFP. An event review team eliminated equipment failure as a root cause and determined that the root cause of the reactor trip was most likely due to the operators failing to maintain the lockout control switch in position during the surveillance. The lockout control switch is a spring return switch which is held in place by an operator to lock out the SGFP trip circuit while testing the SGFP.

This finding is more than minor because it is associated with the human performance attribute of the Initiating Events cornerstone and is associated with an increase in the likelihood of an initiating event, in that a reactor trip actually occurred. The significance of the finding was determined to be very low since this finding did not contribute to the likelihood of a primary or secondary loss of coolant accident initiator, did not contribute to both the likelihood of a reactor trip and the unavailability of mitigation equipment or functions, and did not increase the likelihood of a fire or internal/external flood. This finding is related to the cross-cutting issue of Human Performance. (Section 1R14)

- Green. A self-revealing non-cited violation of Technical Specification (TS) 6.8.1 was identified for the inadequate implementation of vendor technical manual requirements into operating procedures for vital shutdown cooling component power supplies. Specifically, an incorrect version of a vendor technical manual was used as the basis for establishing switch lineups in a procedure that

paralleled two alternating current (AC) sources to a vital electrical panel. The incorrect steps allowed the two AC sources to be paralleled out of phase. The electrical panel was supplying power to shutdown cooling equipment and the improper switch lineup resulted in paralleling the two AC sources without synchronous protection. When the sources were paralleled, they were out of phase resulting in the loss of both power supplies and a temporary loss of shutdown cooling. Dominion restored power within 15 minutes, the shutdown cooling system configuration was regained, and control of reactor coolant system temperature was reestablished.

The finding is more than minor because it was associated with the initiating event cornerstone attribute of procedure quality and affected the likelihood of a loss of shutdown cooling (SDC) in that an actual loss of SDC occurred. However, the finding was determined to be of very low safety significance (Green) since there was not a significant loss of thermal margin and the finding did not degrade Dominion's ability to recover shutdown cooling once it was lost. This finding is related to Dominion's Problem Identification and Resolution process. (Section 4OA5.2)

Unit 3

- Green. The inspectors identified a finding for the failure to implement adequate post maintenance testing following valve repairs on the instrument air system. The post maintenance test (PMT), as performed by Operations, did not adequately cycle a 4-way valve to ensure maintenance had been performed correctly. As a result of the improper PMT performance, Dominion did not identify maintenance errors following reinstallation of the 4-way valves prior to declaring the system operable. Subsequently, the instrument air system lost air pressure 4 hours after restoring the system to service. However, the transient was limited because a service air system cross-tie valve opened to restore instrument air pressure. Following the air transient, Dominion performed corrective maintenance, and implemented a procedure to fully retest the instrument air dryer prior to declaring it operable.

The finding is more than minor because it affected the equipment performance attribute of the Initiating Events cornerstone objective of limiting the likelihood of events that upset plant stability at power. The failure to specify adequate PMT led directly to a degraded instrument air system and increased the likelihood of a Loss of Instrument Air event. The risk of this finding was determined to be of very low safety significance (Green) because, although the instrument air system vented to atmosphere, the service air system cross-tie valve to the instrument air system opened and instrument air system pressure was restored. The instrument air system pressure stabilized and recovered such that there was no actual loss of equipment due to the temporary drop in pressure and an actual loss of the instrument air system did not occur. This finding is related to the cross-cutting issue of Human Performance. (Section 1R19)

B. Licensee-Identified Violations

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

REPORT DETAILS

Summary of Plant Status

Unit 2 operated at essentially 100% power for the duration of the inspection period with three exceptions. On March 5, 2004, the Unit reduced power to 90% power for approximately five hours for main turbine control valve testing. On March 6, 2004, the plant tripped from 100% power due to a steam generator feed pump trip. The Unit was restored to 98% power on March 8, 2004, and remained at 98% power due to a "C" circulating water pump bay outage for routine maintenance. The Unit was restored to 100% power on March 13, 2004. On March 15, 2004, the plant tripped from 100% power due to operator error while conducting steam generator feed pump turbine testing. The Unit was restored to 100% power on March 19, 2004, and operated at essentially 100% power for the remainder of the inspection period.

Unit 3 began the inspection period operating at 100% power. On March 10, 2004, the plant began coastdown operation in preparation for Refueling Outage 9 (3R09). The Unit ended the inspection period with the plant operating at approximately 90% power.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 - 1 Unit 3 Sample)

a. Inspection Scope

The inspectors performed a review of cold weather preparations. The inspectors reviewed Dominion's preparations for adverse weather and its impact on the protection of safety-related systems, structures, and components. The inspection was intended to ensure that the indicated equipment, its instrumentation, and its supporting structures were configured in accordance with Dominion's procedures and that adequate controls were in place to ensure functionality of the systems. The inspectors reviewed Dominion's procedures and walked down the system to ensure the equipment was aligned and operating to protect mitigating systems from adverse weather affects. Documents reviewed during the inspection are listed in the Attachment.

Unit 3

- Emergency Diesel Generator Ventilation System

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)a. Inspection ScopePartial System Walkdowns (71111.04Q - 3 Unit 2 and 3 Unit 3 Samples)

The inspectors performed six partial system walkdown samples during this inspection period. The inspectors reviewed the documents listed in the Attachment to determine the correct system alignment. The inspectors conducted a walkdown of each system to verify that the critical portions of selected systems, such as valve positions, switches, and breakers, were correctly aligned in accordance with these procedures and to identify any discrepancies that may have had an effect on operability. The inspectors verified that equipment alignment problems that could cause initiating events, impact mitigating system availability or function, or affect barrier functions, were identified and resolved. The following systems were reviewed based on their risk significance for the given plant configuration:

Unit 2

- Partial equipment alignment of "B" motor driven auxiliary feedwater (MDAFW) during "A" MDAFW pump drain line maintenance (1/27/2004)
- Partial equipment alignment of high pressure safety injection (HPSI) Facility 2 during HPSI Facility 1 surveillance (1/30/2004)
- Partial equipment alignment of "A" emergency diesel generator (EDG) during "B" EDG maintenance (3/13/2004)

Unit 3

- Partial equipment alignment of "B" safety injection-high (SIH) during testing of "A" SIH (2/23/2004)
- Partial equipment alignment of "B" Quench Spray System following maintenance (1/29/2004)
- Partial equipment alignment of "A" EDG during maintenance on "B" EDG (2/17/2004)

Complete System Walkdown. (71111.05S - 1 Unit 3 Sample)

The inspectors conducted one detailed sample of the alignment and condition of the Unit 3 Spent Fuel Pool Cooling System. The inspectors used the licensee procedures and other documents listed below to verify proper system alignment:

- DWG 25212-26911, Revision 30, Fuel Pool Cooling and Purification System
- Emergency Operating Procedure (EOP) 3505A, Revision 005-03, Loss of Spent Fuel Pool Cooling
- OP 3305-001, Revision 005, Fuel Pool Cooling System - Valve Lineup
- OP 3305-007, Revision 001-01, Fuel Pool Cooling and Purification System- Electric Lineup

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- OP 3303A, Revision 009-07, Spent Fuel Pool Bridge
- EOP 3501, Revision 13, Loss of All AC Power (Mode 5, 6 and Zero)

A review of outstanding maintenance work orders was performed to verify that the deficiencies did not significantly affect the spent fuel pool cooling system function. In addition, the inspectors reviewed the condition report database to verify that spent fuel pool cooling system equipment alignment problems were being identified and appropriately resolved.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05Q)

1. Quarterly Sample Review (71111.05Q - 6 Unit 2 and 7 Unit 3 Samples)

a. Inspection Scope

The inspectors performed thirteen walkdown samples of fire protection areas during the inspection period. The inspectors reviewed Dominion's fire protection program to determine the required fire protection design features, fire area boundaries, and combustible loading requirements for selected areas. The inspectors walked down those areas to assess Dominion's control of transient combustible material and ignition sources. In addition, the inspectors evaluated the material condition and operational status of fire detection and suppression capabilities, fire barriers, and any related compensatory measures. The inspectors then compared the existing conditions of the inspected fire protection areas to the fire protection program requirements to ensure all program requirements were being met. Documents reviewed during the inspection are listed in the Attachment. The fire protection areas reviewed included:

Unit 2

- West DC Switchgear Room - Auxiliary Building, 14' 6" Elevation (Fire Area A-21, App R Area R-10)
- "A" Safeguards Room - Auxiliary Building, -45' Elevation (Fire Area A-A8)
- "B" Safeguards Room - Auxiliary Building, -45' Elevation (Fire Area A-3)
- "C" Safeguards Room - Auxiliary Building, -45' Elevation (Fire Area A-4)
- General Area, Auxiliary Building, -45' Elevation (Fire Area A-1A)
- "A" Emergency Diesel Generator Room - Auxiliary Building, 14'-6" Elevation (Fire Area A-15)

Unit 3

- Engineered Safety Features Building - Fire Area 7
- Engineered Safety Features Building - Fire Area 8

- Engineered Safety Features Building - Fire Area 9
- Engineered Safety Features Building - Fire Area 10
- Turbine Building Turbine Deck
- "A" EDG Fuel Oil Vault
- "B" EDG Enclosure, Fire Area EG-4

b. Findings

No findings of significance were identified.

2. Annual Fire Drill Observation (71111.05A - 1 Unit 2 Sample)

a. Inspection Scope

Unit 2

The inspectors observed one sample of personnel performance during a fire brigade drill on January 28, 2003, to evaluate the readiness of station personnel to prevent and fight fires. The drill simulated a fire in the Unit 2 Turbine Building. The inspectors observed the fire brigade members using protective clothing, turnout gear, and self-contained breathing apparatus and entering the fire area in a controlled manner. The inspectors also observed the fire fighting equipment brought to the fire scene to evaluate whether sufficient equipment was available to effectively control and extinguish the simulated fire. The inspectors evaluated whether the permanent plant fire hose lines were capable of reaching the fire area and whether hose usage was adequately simulated. The fire fighting directions, orders and communications among the fire brigade members were closely monitored. The inspectors verified that the preplanned drill scenario was followed and observed the post drill critique to evaluate if the drill objectives were satisfied and that any drill weaknesses were discussed. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06 - 1 Unit 3 Sample)

a. Inspection Scope

The inspectors reviewed one sample of flood protection measures in the Unit 3 "B" EDG enclosure. This review was conducted to evaluate the licensee's protection of the enclosed safety-related systems from internal flooding conditions. The inspectors performed a walkdown of the area, reviewed the Final Safety Analysis Report, and design basis documents, including flooding calculations. The inspectors compared the as-found equipment and conditions to ensure they remained consistent with those indicated in the design basis documentation, flooding mitigation documents, and risk

analysis assumptions. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07A - 1 Unit 2 Sample)

a. Inspection Scope

The inspectors reviewed one sample of a safety related heat exchanger test to identify any degraded performance or potential for common cause problems that could increase plant risk. The inspectors reviewed the results of the Unit 2 "C" reactor building component cooling water heat exchanger inspection, performed in accordance with Maintenance Procedure (MP) 2701J-096, Revision 007, "Service Water Cooled Heat Exchanger Subject to GL 89-13." The inspectors reviewed the inspection results against the acceptance criteria contained within the procedure, and verified that all acceptance criteria had been satisfied. The inspectors also reviewed the Final Safety Analysis Report to ensure that heat exchanger inspection results were consistent with the design basis. The inspectors verified that adverse conditions identified by Dominion were appropriately entered into the corrective action program. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11Q - 1 Unit 2 and 1 Unit 3 Sample)

a. Inspection Scope

Unit 2

The inspectors observed one sample of licensed operator simulator training for Unit 2 on February 20, 2004. The inspectors observed licensed operator training on Emergency Core Cooling System (ECCS) sump clogging recognition and response. The inspectors evaluated the ability of each operations crew to mitigate the consequences of the failures presented in the accident scenarios, the ability of Dominion's evaluators to adequately address operator performance deficiencies that were identified during the exercise, and that applicable training objectives had been achieved. Additionally, the inspectors evaluated use of formal communications, response to alarms, proper use of procedures, oversight provided by the shift supervisor including emergency plan actions and notifications, and overall crew teamwork. Finally, the inspectors reviewed the simulator physical fidelity as compared to the actual Unit 2 control room conditions. Documents reviewed during the inspection are listed in the Attachment.

Unit 3

The inspectors observed one sample of Unit 3 licensed operator simulator training on February 24, 2004. The inspectors observed licensed operator performance relative to the following activities: training on nuclear instruments and estimated critical position indication. The inspectors verified that the training evaluators adequately addressed operator performance issues that were identified during the exercise, and that applicable training objectives had been achieved. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R12 Maintenance Implementation (71111.12Q - 3 Unit 2 and 3 Unit 3 Samples))

a. Inspection Scope

The inspectors reviewed six samples of Dominion's evaluation of degraded conditions, involving safety-related structures, systems and/or components (SSC) for maintenance effectiveness during this inspection period. The inspectors reviewed licensee implementation of the Maintenance Rule (MR), 10 CFR 50.65, and verified that the conditions associated with the referenced CRs were appropriately evaluated against applicable MR functional failure criteria as found in licensee scoping documents and procedures. The inspectors also discussed these issues with the system engineers and maintenance rule coordinators to verify that they were appropriately tracked against each system's performance criteria and that the systems were appropriately classified in accordance with MR implementation guidance. Documents reviewed during the inspection are listed in the Attachment. The following conditions were reviewed:

Unit 2

- Control Room Air Conditioning Thermostatic Controller (CR-04-00759)
- No. 1 Feed Regulating Valve Controller (CR-04-02627)
- Shutdown Reactor Vessel Level Instrumentation (CR-03-11600)

Unit 3

- Instrument Air Dryer Failure (CR-04-00953)
- Reactor Plant Chill Water Cooling Unit Failure (CR-04-00953)
- Charging System Letdown Failure (CR-04-02256)

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation
(71111.13 - 6 Unit 2 and 4 Unit 3 Samples)a. Inspection Scope

The inspectors reviewed 10 samples of the adequacy of maintenance risk assessments of emergent and planned activities during the inspection period. The inspectors utilized the Equipment Out of Service (EOOS) quantitative risk assessment tool to evaluate the risk of the plant configurations and compared the result to the licensee's stated risk. The inspectors verified that Dominion entered appropriate risk categories and implemented risk management actions as necessary. Documents reviewed during the inspection are listed in the Attachment. The inspectors verified the conduct and adequacy of scheduled maintenance risk assessments for plant conditions affected by the conduct of the following scheduled maintenance and testing activities:

Unit 2

- Work Schedule for the week of 01/19/04 - risk assessment for maintenance/testing on control room air conditioning and "B" linear power range drawer calibration
- Work Schedule for the week of 02/09/04 - risk assessment for maintenance/testing on "C" charging pump, "B" hydrogen analyzer, "B" enclosure building filtration system damper, auto auxiliary feedwater test, offsite power line, and station blackout diesel
- Work Schedule for the week of 02/16/04 - risk assessment for maintenance/testing on "B" shutdown cooling heat exchanger, "B" containment spray pump seal cooler, and station blackout diesel
- Work Schedule for the week of 02/23/04 - risk assessment for maintenance/testing on "A" high pressure safety injection (HPSI) surveillance with "B" HPSI in pull-to-lock
- Work Schedule for the week of 03/01/04 - risk assessment for maintenance/testing on turbine building component cooling water heat exchanger and control room air-conditioning surveillance
- Work Schedule for the week of 03/08/04 - risk assessment for emergent maintenance/testing on the switchyard north bus and the potential for a Red Risk condition

Unit 3

- Work Schedule for the week of 01/12/04 - risk assessment for maintenance/testing on "B" service water pump, "B" circulating water pump, and "B" motor driven auxiliary feedwater pump
- Work Schedule for the week of 01/19/04 - risk assessment for maintenance/testing on "B" emergency diesel generator, containment isolation valves, and solid state protection systems
- Work Schedule for the week of 03/08/04 - risk assessment for emergent issue requiring removal of north electric ring bus with degraded intake structure, "B" instrument air compressor unavailable, and letdown system isolated
- Work Schedule for the week of 03/29/04 - risk assessment for maintenance/testing on "A" emergency diesel generator, "A" residual heat removal, and "B" condensate pump

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Non-Routine Plant Evolutions (71111.14 - 3 Unit 2 and 3 Unit 3 Samples)

a. Inspection Scope

The inspectors reviewed six events which demonstrated personnel performance in coping with the non-routine evolutions and transients identified below. The inspectors observed operations in the control room, reviewed applicable operating and alarm response procedures and technical specifications, plant process computer indications, and control room shift logs to evaluate the adequacy of the licensee response to these events. The inspectors also verified the events were entered into the corrective action program to resolve identified adverse conditions. Documents reviewed during the inspection are listed in the Attachment.

Unit 2

- On February 20, 2004, the inspectors observed operations response to operability issues identified with the charging system pulsation dampeners. Following completion of a planned "C" charging pump motor replacement, a plant equipment operator (PEO) noticed unusual noise coming from the charging system. Engineering identified that the "C" charging pump discharge pulsation dampener may not be charged to its specified value. Operations questioned whether the charging system was fully operable with the pulsation dampeners in this condition. Since the operation of the pulsation dampeners was in question, Operations declared the system inoperable and entered T.S. 3.0.3. The "C" charging pump was tagged out to prevent simultaneous start of two charging pumps with one charging pump running. Once the "C" charging pump was tagged, Operations exited T.S. 3.0.3.

Enclosure

- On March 6, 2004, the Unit 2 reactor was manually tripped from 100% power due to lowering steam generator water level from the trip of the "B" steam generator feed pump (SGFP). Dominion established an Event Review Team (ERT) to determine the cause. The ERT identified that electrical contacts in an SGFP electrical cabinet were sensitive to mechanical agitation. As a result, these normally closed contacts would open when mechanically agitated and cause a false trip signal in the SGFP control circuitry. Dominion changed the contact design to remove this trip circuit vulnerability. Additionally, the licensee had to shut the main steam isolation valves following the trip due to high vibrations on the turbine generator due to rubbing of the newly installed turbine monoblock rotor.
- On March 15, 2004, the Unit 2 reactor automatically tripped from 100% power while performing quarterly testing of the "B" SGFP. During testing of the "B" SGFP turbine emergency governor, the "B" SGFP tripped which caused steam generator water level to decrease. An automatic reactor trip occurred when the steam generator water level reached the automatic trip low level set point. An ERT determined that the cause of the reactor trip was most likely due to the lockout control switch coming out of position during the surveillance. The lockout control switch is a spring return switch which is held in place by an operator to lockout the SGFP trip circuitry while testing the SGFP.

Unit 3

- On January 7, 2004, the inspectors monitored the re-indexing activities, the withdrawing of rods to add reactivity to the reactor at the end of core life and the subsequent power transient. The operators discussed the potential for additional reactivity being added during this evolution and had discussed actions to address the concern as part of the pre-evolution brief. The operators performed compensatory actions such as not performing primary plant dilutions, maximizing the operating temperature band to allow for a temperature increase, monitoring the change in reactor coolant temperature, and conducting the activity such that the transient would be over prior to changing crews. Subsequent to the re-indexing evolution, the resultant 8-hour transient was controlled by the crew by reducing turbine load. Dominion evaluated the transient and determined that the reactivity plan did not properly account for the reactivity that was added as a result of this evolution because the plan had not accounted for the large change in axial flux distribution at this age in core life.
- On February 26, 2004, while operating at 100% power, Dominion discovered the supply line for cooling to the main generator exciter diode bank #4 was leaking at approximately 1 gpm. A similar leak had been isolated to diode bank #5. The licensee technical documents stated that 4 diode banks were required to operate the generator. Dominion evaluated that the leaking water was not affecting the operability of the diode banks in service, consulted with the manufacturers on the plant condition required to remove a second diode bank from service, and

developed plans to repair the leaking pipe. Dominion repaired both leaking supply lines and restored 100% capability to the system within 24 hours.

- On March 9, 2004, Dominion entered AOP 3555, RCS Leak, due to a report of water leakage heard and observed at the demineralizer valve station. Operations was placing the deborating demineralizer in service following replacement of the resin in the tank. The operators had established communications between the local operating station and the control room and were performing the restoration per OP 3304A, Charging and Letdown. Shortly after the demineralizer was placed in service, the coolant flow through the demineralizer stopped and water was heard and seen leaking from an area around the valve station. Operations entered AOP 3555 and isolated the piping associated with the demineralizer which stopped the leak. Operations established an alternate flow path for the charging system to stabilize the plant and exited AOP 3555. Dominion established an event review team (ERT) to determine the cause of the leakage. The ERT determined that the downstream filter was blocked by resin from the demineralizer. The direct cause of the leakage was determined to be from the increased pressure resulting from the filter blockage which caused a gasket to separate and a relief valve to lift. The filter was replaced and the piping was flushed to remove resin in the line. Dominion inspected the piping, demineralizer, and filter housing and restored the system to normal on March 13, 2004.

b. Findings

Unit 2

Introduction. A Green, self-revealing, non-cited violation was identified for the failure to adequately implement procedures for SGFP testing which led to a reactor trip.

Description. On March 15, 2004, the Unit 2 reactor automatically tripped from 100% power while performing quarterly testing of the "B" SGFP. During testing of the "B" SGFP turbine emergency governor, the "B" SGFP tripped which caused steam generator water level to decrease. An automatic reactor trip occurred when the steam generator water level reached the automatic trip low level trip set point.

An event review team (ERT) determined that the cause of the reactor trip was most likely due to the lockout control switch coming out of position during the surveillance. The lockout control switch is a spring return switch which is held in place by an operator to lockout the SGFP trip circuit during testing. Surveillance Procedure SP-2659, Steam Generator Feed Pump Periodic Testing, contains direction for the operator to verify the SGFP overspeed trip test has been reset prior to releasing the lockout control switch.

Analysis. The performance deficiency associated with this event is that the plant operators did not adequately implement a plant operating procedure and it was within Dominion's ability to foresee and control. Traditional enforcement does not apply because there were no actual safety consequences, impacts on the NRC's ability to

perform its regulatory function, or willful aspects to the violation. This issue was more than minor because it is associated with the human performance attribute under the Initiating Events cornerstone. The finding is associated with an increase in the likelihood of initiating events in that a reactor trip actually occurred. The inspectors determined that the self-revealing finding was of very low safety significance (Green) through performance of a Phase 1 SDP in accordance with Inspection Manual Chapter (IMC) 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations." Specifically, this finding did not contribute to the likelihood of a primary or secondary loss of coolant accident initiator, did not contribute to the likelihood of a reactor trip and the unavailability of mitigation equipment or functions, and did not increase the likelihood of a fire or internal/external flood. This finding is related to the Human Performance cross-cutting area, in that human performance errors resulted in a reactor trip.

Enforcement. TS 6.8.1a states, in part, that written procedures shall be established, implemented and maintained covering the activities specified in Appendix A of Regulatory Guidance 1.33. Regulatory Guide 1.33, Appendix A, Item 3.K, requires procedures to be implemented for the operation of feed water pumps to steam generators. Contrary to this requirement, during SGFP testing, the operator allowed the lockout control switch to come out of position prior to resetting the overspeed trip test. This violation has been determined to have a very low safety significance and is in Dominion's corrective action program as CR-04-02446. Therefore, it is being treated as a non-cited violation consistent with Section VI.A.1 of the NRC Enforcement Policy (**NCV 05000336/2004005-01**).

1R15 Operability Evaluations (71111.15 - 6 Unit 2 and 4 Unit 3 Samples)

a. Inspection Scope

The inspectors reviewed ten samples of operability determinations associated with degraded or non-conforming conditions to ensure that operability was justified and that mitigating systems or those affecting barrier integrity remained available and no unrecognized increase in risk had occurred. The inspectors also reviewed compensatory measures to ensure that the compensatory measures were in place and were appropriately controlled. The inspectors reviewed licensee performance to ensure all related technical specification (TS) and Final Safety Analysis Report (FSAR) requirements were met. The inspectors reviewed the following degraded or non-conforming conditions:

Unit 2

- #1 Feed Regulating Valve Controller will not Shift to Manual (CR-04-02627)
- Station Blackout Diesel Fuel Oil Tank Sample (CR-04-01593)
- Z2 Circuit Breakers have Blistered Outer Jackets (CR-03-08579)
- Low Pre-Charge Pressure Suspected in Charging Pump Pulsation Dampeners (CR-04-01647)

- Gaseous Effluent Response Factors Need to be Adjusted for Pressure Error (CR-04-01850)
- Feed Regulating Valve Leakage and Assumptions in Safety Analysis (CR-04-03014)

Unit 3

- Evaluation of Charging System Ventilation (CR-04-00728)
- Evaluation of Condenser due to Gland Seal Valve Misposition (CR-04-01022)
- SW leak due to loss of brazing at motor operated valve (MOV) 115A (CR-04-02228)
- Containment fire strategy during "B" instrument air compressor inoperability (CR-04-02021)

b. Findings

No findings of significance were identified.

1R16 Operator Work-Arounds (71111.16 - 1 Unit 2 and 1 Unit 3 Sample)

a. Inspection Scope

Selected Operator Work-Arounds

The inspectors reviewed one sample of a risk significant operator work-around (OWA) for Unit 2 during the inspection period. The Control Room Air-Conditioning System logic does not restart fans automatically following a Safety Injection Actuation Signal in conjunction with a Loss of Normal Power. The inspectors evaluated the condition to determine if there was any affect on human reliability in responding to an initiating event or any adverse affects on the function of mitigating systems. The OWA was also reviewed to ensure compliance with licensee documents which administratively control OWAs. Documents reviewed during the inspection are listed in the Attachment.

Cumulative Effects of Operator Work-Arounds

The inspectors reviewed the current listing of active OWAs for Millstone Unit 3. The review was conducted to verify that Millstone procedures and practices provided the necessary guidance to plant personnel, that the cumulative effects of the known OWAs were addressed and that the overall impact on the affected systems was assessed by Dominion. The inspectors independently assessed the cumulative impact of known OWAs to determine if they adversely affected the ability of plant operators to implement emergency procedures, respond to plant transients, or perform normal functions within the expectations of the established Dominion risk models. In support of this assessment, the inspectors reviewed various condition reports (CR) regarding operator work-arounds, and verified that they were being identified, tracked, and resolved in Dominion's corrective action program.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17A - 1 Unit 2 Sample)

a. Inspection Scope

The inspectors reviewed one sample of a permanent plant modification on Unit 2. The sample included an "A" and "B" steam generator feed pump trip circuit contact realignment. The inspectors performed a walkdown of the area and reviewed the Final Safety Analysis Report, licensing and design basis documents, and the engineering disposition. These reviews were conducted to ensure (1) the modified components remained consistent with the assumptions indicated in the design basis documents, (2) that system availability, reliability, and functional capability were maintained, and (3) no unrecognized conditions that significantly affected risk or could place the plant in an unsafe condition were introduced as a result of the modifications. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19 - 7 Unit 2 and 5 Unit 3 Samples)

a. Inspection Scope

The inspectors reviewed twelve samples of post-maintenance tests (PMT) during this inspection period. The inspectors reviewed these activities to determine whether the PMT adequately demonstrated that the safety-related function of the equipment was satisfied given the scope of the work specified and that operability of the system was restored. In addition, the inspectors evaluated the applicable test acceptance criteria to verify consistency with the associated design and licensing bases, as well as TS requirements. The inspectors also verified that conditions adverse to quality were entered into the corrective action program for resolution. Documents reviewed during the inspection are listed in the Attachment. The following maintenance activities and their post maintenance tests were evaluated:

Unit 2

- "A" Auxiliary Feed Water (AFW) Pump Check Valve 2-FW-32A (M2-03-01738)
- "A" Service Water Pump Packing Replacement (M2-04-00268)
- Enclosure Building Filtration System Fuel Handling Exhaust Motor Operated Damper (M2-01-15843)
- Spent Fuel Pool Level Indication (M2-039-095 and M2-01-14105)
- #1 Atmospheric Dump Valve Repair (M2-03-14346)
- "C" Charging Pump 3 Month Coupling Inspection Lubrication (M2-03-06688)

- Z2 Control Room Air-Conditioning System Fails to Cool the Control Room Adequately (M2-04-00989)

Unit 3

- "B" Quench Spray Pump following Maintenance (M3-03-10656)
- Service Water Pump following Maintenance (M3-01-10422)
- Service Water Pump Motor following Overhaul (M3-01-13442)
- Instrument Air Dryer following Maintenance (M3-04-01359)
- Control Building Air Conditioning Outlet Valve 3SWP*TV35A Inspection and Testing (M3-03-03418)

b. Findings

Unit 2

During a plant walkdown, the inspectors questioned the level indicating system associated with the spent fuel pool (SFP). Dominion previously initiated SFP modification M2-039-095, to validate the level indication provided by a previously installed, undocumented indicator and to provide a redundant level indication for SFP level instrument LS-7424. The licensee was not able to provide the inspectors with a level calibration for the level indication being used for TS compliance that meets their setpoint methodology. Based on the inspectors' review of M2-039-095 and its supporting documentation, additional information is necessary to resolve differences among Engineering Record 96-0291 calculations, LS-7424 calibration records and M2-039-095 data, to ensure that TS requirements for SFP level (above the irradiated fuel) are met. **URI 05000336/2004005-02** will track this issue pending the resolution of NRC questions.

Unit 3

Introduction. A Green finding was identified for the failure to implement an adequate post-maintenance test (PMT) to identify an improperly performed repair on an instrument air system valve.

Description. On February 5, 2004, a failure of the instrument air dryer caused a system transient. The licensee found that the automatic 4-way valves (IAS-AOV50A and IAS-AOV50B), had repositioned such that the instrument air header was vented to atmosphere. This caused instrument air header pressure to rapidly drop to 85 psi (normal system pressure ~102 psi), at which point the cross-connect valve between the instrument air header and service air header opened. The combination of the two instrument air compressors and the service air compressor was able to restore instrument air system pressure. Operators responded and isolated the vent path within ten minutes.

Dominion determined, that following repairs to the instrument air system, the air actuator for 4-way valve IAS-AOV50B was not reinstalled correctly. They found that when the valves were disassembled for maintenance, the air actuator hose connections were not marked for identification as required by the work order. This led to reinstallation of the valve 90 degrees out of the correct alignment position. The inspectors determined that the specified PMT, "Cycle," as defined in Attachment 4 of MP-20-WP-GDL40, Rev. 2, "Pre and Post-Maintenance Testing," requires the component to be cycled under normal conditions and through its full travel. The inspectors determined that the work order indicated that Maintenance had performed a bench test on the repaired valves and that Operations had performed one system cycle. This system cycle did not verify that the system would be operable in each of the 4-way valve's positions. Operations subsequently approved the PMT and returned the system to service.

In addition, the inspectors noted that in Attachment 3.1 of MP-20-WP-GDL40, Rev. 2, the requirement to contact the system engineer if maintenance on air actuators could affect component/systems automatic function or interlocks, was not performed. The inspectors determined that the system engineer was not consulted to assist in the preparation of an acceptable testing procedure which could have precluded this event.

Analysis. The performance deficiency associated with this issue is that Dominion failed to adequately perform post-maintenance testing to ensure incorrect maintenance activities were identified prior to returning the system to service and declaring it operable. Traditional enforcement does not apply to this issue because there were no actual safety consequences, impacts on the NRC's ability to perform its regulatory function, or willful aspects to the violation. The finding is more than minor because it affected the equipment performance attribute of the Initiating Events cornerstone objective of limiting the likelihood of events that upset plant stability at power. The failure to specify adequate PMT led directly to a degraded instrument air system and increased the likelihood of a Loss of Instrument Air event. The inspectors determined that the finding was of very low safety significance (Green) through performance of a Phase 1 SDP in accordance with Inspection Manual Chapter (IMC) 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations." Specifically, the finding did not contribute to the likelihood of a Primary or Secondary system loss of coolant accident initiator; contribute to both the likelihood of a reactor trip and the likelihood that mitigating equipment will not be available; or increase the likelihood of a fire or internal/external flood. The instrument air system remained operable during the duration of the transient. Therefore, the risk of this finding was determined to be of very low safety significance, Green. This finding is related to the cross-cutting issue of Human Performance.

Enforcement. There were no violations of NRC regulatory requirements since the instrument air system is not safety-related. However, the instrument air system functions have an impact on the overall plant risk and the inspectors determined that the licensee was ineffective at identifying that improper maintenance had occurred prior to returning the instrument air system to service. The issues relating to this inspection

were documented by the Dominion corrective action program under CR-04-01129.
(FIN 05000423/2004005-03)

1R20 Refueling and Outage Activities (71111.20 - 2 Unit 2 Samples)

a. Inspection Scope

The inspectors reviewed two samples of forced outages following two Unit 2 reactor trips on March 6, 2004 and March 15, 2004 for compliance to Technical Specification requirements and approved procedures, conduct of outage risk evaluations, configuration control, and maintenance of key safety functions. Documents reviewed during the inspection are listed in the Attachment. During these forced outages, the inspectors monitored licensee control of the outage activities listed below:

- Shutdown risk evaluations
- Startup scheduling
- Reactor Startup and Criticality
- Plant Startup
- Power Ascension

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 - 7 Unit 2 and 6 Unit 3 Samples)a. Inspection Scope

The inspectors reviewed thirteen samples of surveillance activities to determine whether the testing adequately demonstrated the equipments' operational readiness and its ability to perform its intended safety-related function. The inspectors attended pre-job briefs, verified that selected prerequisites and precautions were met and that the tests were performed in accordance with the procedural steps. Additionally, the inspectors evaluated the applicable test acceptance criteria to verify consistency with associated design basis, licensing bases and TS requirements, and that the applicable acceptance criteria were satisfied. The inspectors also verified that conditions adverse to quality were entered into the corrective action program for resolution. Documents reviewed during the inspection are listed in the Attachment. The following surveillance activities were evaluated:

Unit 2

- Facility 2 Motor Driven Auxiliary Feedwater Pump and Recirculation Check Valve Inservice Test (SP-2610A)
- "A" High Pressure Safety Injection IST (SP-2604A)
- "A" EDG Slow Start Operability Test (SP-2613K)
- Reactor Protection System (RPS) Bistable Trip Test - Channels B & C (SP-2401GB)
- Enclosure Building Filtration System (EBFS) Negative Pressure Test (SP-2609E)
- EBFS and Control Room Ventilation Operability Test, Facility 1 (SP-2609A)
- Turbine Driven Auxiliary Feedwater (TDAFW) Pump Operability Test (SP-2610B)

Unit 3

- "B" Solid State Protection System Operational Test (SP-3446B12)
- Service Water Pump 3SWP*P1C Operational Readiness Test IST (SP-3626.6)
- Temperature Moderator Coefficient Verification (SP-31005A)
- Slave Relay Testing - Containment Isolation Phase A (SP-3646A.8)
- TDAFW Time Response Testing (SP-3622.2)
- TDAFW inservice testing (SP-3622.3)

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23 - 1 Unit 2 and 1 Unit 3 Sample)a. Inspection Scope

The inspectors reviewed two samples of temporary modifications to verify that the temporary modification did not affect the safety function of important safety systems. The inspectors reviewed each temporary modification and its associated 10 CFR 50.59 screening against the FSAR and TS to ensure the modification did not affect system operability or availability. Documents reviewed during the inspection are listed in the Attachment.

Unit 2

- Electro-Hydraulic Control (EHC) Fluid Collection for EHC Fluid Leak in Front Standard (TM-2-04001)

Unit 3

- Disable Electrical Reset of Makeup Batch Counters (TM-5-02-004)

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness [EP]1EP4 Emergency Action Level (EAL) and Emergency Plan Changes (71114.04 - 1 Sample)a. Inspection Scope

A regional in-office review was conducted of licensee-submitted revisions to the emergency plan, implementing procedures and emergency action levels (EAL) which were received by the NRC during the period of January - March 2004. A thorough review was conducted of plan aspects related to the risk significant planning standards (RSPS), such as classifications, notifications and protective action recommendations. A cursory review was conducted for non-RSPS portions. These changes were reviewed against 10 CFR 50.47(b) and the requirements of Appendix E and they are subject to future inspections to ensure that the combination of these changes continue to meet NRC regulations. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 4, and the applicable requirements in 10 CFR 50.54(q) were used as reference criteria.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety [OS]

2OS1 Access Control to Radiologically Significant Areas (71121.01 - 11 Samples)

a. Inspection Scope

During the period of January 26-29, 2004, the inspector conducted the following activities to verify that Dominion was properly implementing physical, administrative, and engineering controls for access to locked high radiation areas, and other radiologically controlled areas, and that workers were adhering to these controls when working in these areas. Implementation of these controls was reviewed against the criteria contained in 10 CFR 20, applicable industry standards, and Dominion's procedures. This inspection activity represents completion of eleven samples relative to this inspection area.

Plant Walkdown and Radiation Work Permit Reviews

The inspector identified exposure significant work areas in Units 2 and 3 including areas in the Unit 2 Auxiliary Building and Containment Building, and the Unit 3 Fuel Handling Building and Engineered Safeguards Building. The inspector reviewed radiation survey maps for the work areas located in these buildings and reviewed the radiation work permits (RWP) for the work associated with these areas, to determine if the radiological controls were acceptable.

The inspector toured accessible radiological controlled areas in Units 2 and 3, and with the assistance of a radiation protection technician performed independent radiation surveys of selected areas to confirm the accuracy of survey data and the adequacy of postings.

In reviewing RWPs, the inspector reviewed electronic dosimeter dose/dose rate alarm setpoints to determine if the setpoints were consistent with the survey indications and plant policy. The inspector verified that the workers were knowledgeable of the actions to be taken when the electronic dosimeter alarms or malfunctions for tasks being conducted under selected RWPs. Work activities reviewed included maintenance on the Unit 3 quench spray pump (RWP 3), fuel movements in the Unit 3 spent fuel pool (RWP 38), check valve testing in the Unit 2 charging system (RWP 30), removal of a Boral test coupon from the Unit 3 spent fuel pool (RWP 38), and decontamination/inspection of a Unit 3 residual heat removal pump (RWP 40).

The inspector reviewed RWPs and associated instrumentation and engineering controls for potential airborne radioactivity areas. Through review of relevant documentation, the inspector confirmed that no worker received an internal dose in excess of 50 mrem due to airborne radioactivity for 2003.

The inspector examined the physical and programmatic controls for highly activated materials stored in the Unit 2 and 3 spent fuel pools.

Problem Identification and Resolution

The inspector reviewed elements of Dominion's Corrective Action Program related to controlling access to radiologically controlled areas, completed since the last inspection of this area, to determine if problems were being entered into the program for resolution. Details of this review are contained in Section 4OA2.3 of this report.

Jobs-In-Progress

The inspector observed aspects of various maintenance and operational activities being performed during the inspection period to verify that radiological controls, such as required surveys, area postings, job coverage, and pre-job RWP worker briefings were conducted; personnel dosimetry was properly worn; and that workers were knowledgeable of work area radiological conditions. Tasks observed were selected aspects of the maintenance on the Unit 3 quench spray pump, removal of a Boral coupon from the Unit 3 spent fuel pool, decontamination/inspection of a Unit 3 residual heat removal pump, check valve testing in the Unit 2 charging system, and preparations for making a Unit 2 containment entry to adjust pressurizer spray bypass valves.

High Risk Significant, High Dose Rate High Radiation Area and Very High Radiation Area Controls

The inspector discussed with the Radiation Protection Manager High Dose Rate (HDR) areas and Very High Radiation Area (VHRA) controls and procedures. The inspector verified that any changes to relevant licensee procedures did not substantially reduce the effectiveness and level of worker protection. Controls for significant high risk areas reviewed included entries into the Unit 2 containment building and removal of material from the Unit 3 spent fuel pool.

The inspector discussed with the first line radiation protection supervisors the controls in place for special areas that have the potential to become VHRA during certain plant operations. The inspector evaluated the prerequisite communications to the radiation protection department, so as to allow completion of timely actions, such as properly posting and controlling the affected areas.

Keys to Unit 2 and Unit 3 locked high radiation areas (LHRA) and very high radiation areas were inventoried and accessible LHRA's were verified to be properly secured and posted during plant tours.

Radiation Worker/Radiation Protection Technician Performance

The inspector observed radiation worker and radiation protection technician performance by attending work planning meetings, a work week critique meeting, and various pre-job RWP briefings. The inspector also observed workers performing various tasks inside the radiological controlled areas including performing maintenance on a Unit 3 quench spray pump, moving fuel in the Unit 3 spent fuel pool, and testing a Unit 2 charging system check valve. During task observations, the inspector determined that individuals were aware of job site radiological conditions, RWP requirements, and electronic dosimetry setpoints; and that the skill level was sufficient with respect to the radiological hazards and the work involved.

The inspector reviewed condition reports related to radiation worker and radiation protection technician errors to determine if an observable pattern traceable to a similar cause was evident.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES [OA]

4OA1 Performance Indicator Verification (71151 - 2 Unit 2 and 2 Unit 3 Samples)

a. Inspection Scope

The inspectors reviewed the performance indicator (PI) samples listed below to verify the accuracy of the PI data reported during that period. The PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Indicator Guideline," Revision 2, were used to verify the basis for reporting each data element.

Unit 2 Reactor Safety Cornerstone (2 Samples)

- Reactor Coolant System Leak Rate
- Reactor Coolant System Specific Activity

Unit 3 Reactor Safety Cornerstones (2 Samples)

- Safety System Functional Failures
- EDG Unavailability

The inspectors reviewed licensee event reports, monthly operating reports, plant process shift logs, condition reports and NRC inspection reports to identify safety system equipment failures and unavailability that occurred from the first quarter of 2003, through the fourth quarter 2003. Additionally, the inspectors observed a primary sample to verify the adequacy of the procedure and ensure that activity levels in the primary system were being accurately determined. The inspectors also reviewed daily logs to

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determine daily leakage rates from the primary system. Documents reviewed during the inspection are listed in the Attachment. The inspectors compared this information with Dominion's data reported to the NRC for the performance indicators (PI) listed above to verify that PI reporting and proximity to PI thresholds published on the NRC web site were accurate.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

1. Annual Sample Review (1 Unit 2 Sample)

a. Inspection Scope

The inspectors selected the corrective actions taken by Dominion for a ventilation related issue in the East and West 480 VAC Switchgear rooms for an annual Problem Identification and Resolution (PIR) sample review. Dominion's evaluation and implementation of new procedures for implementing compensatory cooling measures for the Unit 2 East 480 VAC Switchgear Room, West 480 VAC Switchgear Room, East DC Switchgear Room and West DC Switchgear Room, were reviewed in detail by the inspectors. This inspection was conducted as a follow up to the West 480 Volt AC Switchgear Room Compensatory Cooling issue documented in Inspection Report 05000336/2003010 and in the Dominion corrective action process. The inspectors walked down the rooms of concern, interviewed Engineering and Operations staff, and reviewed Operating Procedure (OP) 2315D, Vital Electric Switchgear Room Cooling Systems. Additionally, the inspectors attended Site Operations Review Committee (SORC) meetings and reviewed condition reports (CRs) related to the issuance and implementation of the procedure.

The inspectors reviewed NRC Inspection Report 05000336/2003010 that recorded an event in November 2003, during which Dominion declared the portion of the compensatory cooling air flow used for the West 480 VAC Switchgear Room inoperable. The system was declared inoperable because of the existence of large variations between the assumed design air flow rate through the room and the actual flow rates developed by the installed compensatory cooling equipment. The inspectors further reviewed Dominion's extent of condition efforts that included a related calculation and installation procedures for all compensatory cooling installations. This review was conducted to determine if the East 480 VAC switchgear room, East direct current (DC) switchgear room, and West DC switchgear room design calculations and procedures were adequate. Finally, the inspectors reviewed Dominion's subsequent efforts which included extensive testing and calculations to establish new acceptable flow rates and ventilation configurations.

b. Findings and Observations

No findings of significance were identified.

One observation was developed during the inspection of Dominion's corrective actions which addresses a PIR performance deficiency.

The new procedure that Dominion developed to ensure the availability of vital switchgear for all design basis events when compensatory measures were implemented, included aspects that were questioned by Dominion Fire Protection personnel. On November 19, 2003, a condition report was generated to document the concerns of the Fire Protection personnel who had reviewed the new implementing procedure. The Fire Protection personnel identified that implementing the proposed compensatory measures would result in a configuration that would make a 3-hour fire barrier between the East and West 480 VAC switchgear rooms inoperable. Specifically, the portion of the procedure which installed compensatory cooling to the East 480 VAC switchgear room required that a 480 VAC power cable, used to supply power to temporary ventilation blowers, be installed through the door that separates the East and West 480 VAC switchgear rooms. On November 21, 2003, the Fire Protection engineering organization recommended to Unit 2 Operations that a portion of the proposed compensatory measures be considered inoperable due to the installation of this power cable. However, no administrative controls were put in place to prevent implementation of this portion of the procedure prior to its approval for use on December 4, 2003. On December 11, 2003, subsequent to the inspectors' questions relating to this issue, the portion of the procedure related to the East 480 VAC switchgear compensatory fan installation was declared inoperable and was restricted from implementation in the field.

The observed performance deficiency was that Dominion failed to correct a procedural error that had been identified by Fire Protection personnel, prior to approval of the procedure for implementation in the plant. The subject procedure was never actually implemented in the field and traditional NRC enforcement does not apply because there were no actual safety consequences, impacts on the NRC's ability to perform its regulatory function, or willful aspects related to the performance deficiency. Therefore, this observation is considered a minor violation of NRC requirements, because the Dominion approval and corrective action processes failed to identify the potential degradation of a fire protection feature between redundant safe shutdown systems, had the procedure been implemented in the field.

2. Cross-References to PI&R Findings Documented Elsewhere

Section 4OA5.3 describes a self-revealing finding of the failure to adequately implement vendor technical manual instructions into operating procedures which control safety related equipment system lineups. This problem resulted in the licensee paralleling two AC sources without synchronous protection. When the AC sources were paralleled, they were out of phase and both power supplies were lost. The affected bus had been supplying power to vital shutdown cooling equipment and the power failure initiated a loss of shutdown cooling event.

3. Access Control to Radiologically Significant Areas

a. Inspection Scope

The inspectors reviewed eleven Condition Reports (CRs), recent As Low As Reasonably Achievable (ALARA) Council Meeting notes, a status report for ALARA initiatives completed in 2003, the Nuclear Oversight 2R15 Outage Assessment, the 3R09 outage preparations, and the 2003-2004 Exposure Reduction Plan to evaluate Dominion's threshold for identifying, evaluating, and resolving occupational radiation safety problems. This review included a check of possible repetitive issues such as radiation worker and radiation protection technician errors.

An inspector also attended the work week 0403 critique meeting and Unit 2 containment entry job planning meetings to evaluate current radiation protection issues.

This review was conducted against the criteria contained in 10 CFR 20, Millstone Technical Specifications, and Dominion's procedures.

b. Findings

No findings of significance were identified.

4OA3 Event Followup (71153 - 2 Unit 2 Samples)

1. (Closed) LER 05000336/2003004-00, Reactor Coolant System (RCS) Pressure Boundary Leakage Event, (EA 04-001)

On October 11, 2003, while the unit was in a refueling outage, Dominion identified that very small leakage through two pressurizer heater sleeve penetrations had occurred while the unit was in operation. The leakage had not been detectable during operation because the leakage was very small and was therefore beyond the capability of properly operating RCS leakage detection systems. The leakage was attributed to through wall axial cracks in the alloy 600 heater sleeves. The cause for the cracking was attributed to primary water stress corrosion cracking (PWSCC). The leakage was similar to that previously identified at Millstone 2 and discussed in NRC Inspection Report 05000336/2003002, dated May 12, 2003. The inspectors reviewed information related to the issue and determined that the leakage was not the result of a licensee performance deficiency and was not preventable by reasonable corrective actions that could have been implemented subsequent to the similar leakage condition. Dominion stated in the LER that long term corrective actions for PWSCC in Alloy 600 applications were being developed.

Both leaks were well below the TS limit of one gpm for unidentified RCS leakage. Although the leakage was very small, the inspectors determined the leakage was of greater than minor significance because the RCS pressure boundary, which is designed to be leak-free, was affected. The inspectors determined however, that the issue was of very low safety significance based on the following points. The cracking that led to the leakage was axial in nature. The inspectors judged that axial cracking (vs. circumferential) would not likely result in a complete failure of the pressurizer heater

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sleeve, therefore the leakage would not exceed the normal steady state RCS makeup capability (i.e., the initiating event frequency for the small break loss of coolant accident was unchanged). In addition, the inspectors determined that the leakage would not have affected the function of any other mitigating systems. To further support the very low safety significance characterization, the inspectors noted that the RCS leakage detection equipment had been operable during power operation when the leakage occurred and could have identified any significant levels of RCS leakage. In addition, TS requirements are designed to detect very low levels of RCS leakage to further reduce the probability that flaws could develop into a loss of coolant accident.

The pressurizer heater sleeve leaks represented a violation of TS 3.4.6.2, which prohibits operation in Modes 1-4 with any RCS pressure boundary leakage. Although RCS pressure boundary leakage is a violation of NRC requirements, the NRC has decided to exercise enforcement discretion in accordance with VII.B.6 of the NRC Enforcement Policy and refrain from issuing enforcement action for this violation. Dominion documented this pressure boundary leakage and long term corrective action in CR-02-05391 and CR-03-08856. This LER is closed.

2. (Closed) LER 05000336/2003006-00, Two Manual Reactor Trips due to Turbine Trips caused by Turbine Vibrations

On November 27, 2003, with Unit 2 in MODE 1 at approximately 20% power, the reactor was manually tripped due to high vibration of the main turbine. Additionally, on November 28, 2003, with the plant in MODE 1 at approximately 11% power, the reactor was also manually tripped due to high vibration of the main turbine. Dominion determined that the cause was excessive turbine bearing vibration due to newly installed low pressure turbine monoblock rotors. The LER was reviewed by the inspectors and no findings of significance were identified. Dominion documented the problem in CR-03-12035. This LER is closed.

40A4 Cross Cutting Aspects of Findings

Two findings identified in the inspection report involve the cross-cutting issue of Human Performance.

- Section 1R14 describes a self-revealing finding for the failure to adequately implement a procedure for steam generator feed pump testing. The operators failed to maintain the lockout control switch in place prior to resetting the SGFP test circuitry. This issue resulted in a trip of the SGFP and subsequent trip of the reactor on steam generator low water level.
- Section 1R19 describes a finding for the failure to implement proper post-maintenance testing procedures for repairs of the instrument air system. Three human performance issues contributed to this finding including: maintenance error in reassembly of the 4-way valves, planner error in failure to consult with the system engineer, and operator error in performance of the PMT system cycle. These performance issues resulted in an instrument air transient which

required the service air cross-tie valve to open and operator action to prevent a Loss of Instrument Air event.

40A5 Other Activities

1. Temporary Instruction 2515/TI-154

a. Inspection Scope

Temporary Instruction 2515/TI-154, "Spent Fuel Material Control and Accounting at Nuclear Power Plants" was conducted during this inspection period. Phase I and Phase II of the inspection was completed on Units 1, 2, and 3. Appropriate documentation was provided to NRC management as required.

b. Findings

2. (Closed) URI 05000336/2003010-02, Loss of Shutdown Cooling When AC Supply Sources Were Paralleled Out Of Phase

Introduction. A Green self-revealing non-cited violation of Technical Specification 6.8.1 was identified for the failure to adequately implement vendor technical manual instructions into a procedure used to parallel AC sources which supply vital shutdown cooling loads.

Description. On October 14, 2003, a loss of shutdown cooling occurred with the plant in a cold shutdown condition. Operators were preparing to drain to mid-loop when the power supply to shutdown cooling system valves failed. While performing OP-2345B, "120 Volt Vital Instrument AC System," a power failure caused the shutdown cooling heat exchanger throttle valve to fail closed and the shutdown cooling heat exchanger bypass valve to fail open. This bypassed the shutdown cooling heat exchanger which resulted in a reactor coolant system temperature increase from approximately 101 °F (degrees Fahrenheit) to 115 °F. Due to this uncontrolled reactor coolant system temperature increase of greater than 10 °F, operators declared an Unusual Event in accordance with their Emergency Action Level tables. NRC inspectors responded to the site to observe Dominion's actions. Power was restored to the subject valves within approximately 15 minutes and operators restored shutdown cooling and stabilized reactor coolant system temperature.

Dominion established an Event Review Team to investigate the event and to determine an apparent root cause. The team determined that the procedure, OP-2345B, used by operators to restore the vital 120 volt AC inverter to service following completion of preventive maintenance on the system, was in error. Specifically, the portion of the procedure used to parallel the two AC sources, that could provide power to the vital shutdown cooling loads, did not prevent a switch lineup that allowed both power supplies to be paralleled without synchronous protection. When the power supplies were paralleled, they were out of phase which resulted in the failure of both power supplies and the repositioning of shutdown cooling components to bypass the shutdown cooling

heat exchanger. Further investigation by Dominion determined that this procedure was developed in October 1992 from a vendor technical manual which described the operation of the system. This version of the vendor technical manual allowed the improper switch lineup. A later vendor technical manual revision had been issued in August of 1992 which corrected this error and was available for use by the licensee in February of 1993. However, Dominion failed to implement the technical requirements of the new revision at that time and the vulnerability to this particular switch lineup has existed since then. The failure to implement the revised requirements resulted in the loss of both power supplies to the vital shutdown cooling equipment.

Analysis. The performance deficiency was an inadequate operating procedure which led to a loss of shutdown cooling (SDC) when SDC valves repositioned, due to loss of power, such that there was no flow through the SDC heat exchanger. This issue was more than minor because it was associated with the initiating event cornerstone attribute of procedure quality and affected the likelihood of a loss of SDC, in that an actual loss of SDC occurred.

In accordance with the Reactor Safety SDP, this shutdown condition was evaluated using NRC Inspection Manual Chapter (IMC) 0609, Appendix G, for the associated increases or changes in Core Damage Frequency (Δ CDF) and Large Early Release Frequency (Δ LERF). This issue was not a loss of control as defined by Appendix G, Table 1, so the Phase 1 screening process for Cold Shutdown and Refueling Operations with the RCS open and Refueling Cavity level < 23 feet was used. The Phase 1 process indicated that a Phase 2 analysis was needed because both trains of SDC were affected for approximately 15 minutes and there was an uncontrolled heat up of approximately 14° F.

The issue was determined to be of very low safety significance (Green) for both Δ CDF and Δ LERF with a Phase 2 analysis using the guidance from draft IMC 0609, Appendix G, Risk Informed Inspection Template for PWR during Shutdown, dated December 18, 2003. The loss of SDC was assumed to be a precursor to core damage. The plant operating state was cold shutdown or POS2. The Loss of Residual Heat Removal - LORHR (loss of SDC) initiating event frequency was taken to 0 ($10^0 = 1.0$), because the event occurred. Using Worksheet 9 (LORHR-POS2), the following function credit was given: RHR-S - 1 in 1000, based on greater than 1 hour time to boil. Dominion had the capability of monitoring the RCS heat up using their core exit thermocouples; FEED - 1 in 10000, both HPSI and charging pumps were available, limited by operator credit. In the unlikely event that SDC cooling was not able to be restored, there was a high likelihood that operators could initiate RCS injection and bleed prior to core damage (approximately 5 hours). The operators had two trains of HPSI and two charging pumps that combined could maintain decay heat. The LPSI pumps are not credited after RCS boiling due to the potential of sweeping voids in the RHR drop line; RHR-R - 1 in 100, limited by operator credit; and RWSTMU - 1 in 100, limited by operator credit. The dominant core damage sequences following an LORHR included operators failing to restore SDC prior to boiling and not feeding prior to core damage (using the HPSI or charging system) or feeding successfully, but not being able to refill the RWST. LERF was not a concern because the containment, while open, was capable of reclosure prior

to RCS boiling. Using the guidance in Appendix H, the risk impact of LERF was screened out. The significance of this issue was mitigated by the time afforded prior to boiling by the RCS volume remaining and the ability to return SDC to service.

Enforcement. Technical Specification 6.8.1.a requires, in part, that written procedures be established, implemented, and maintained for activities described in Appendix A of Regulatory Guide (RG) 1.33, "Quality Assurance Program Requirements (Operation)." Specifically, Section 3 of RG 1.33, Appendix A, "Procedures for Startup, Operation, and Shutdown of Safety Related PWR Systems," includes electrical AC systems. Contrary to T.S. 6.8.1a, Dominion failed to adequately implement vendor technical manual requirements into written procedures which control the alignment and operation of electrical power sources to vital shutdown cooling components and, on October 14, 2003, a loss of SDC resulted. However, because the finding is of very low safety significance and the issue has been entered into Dominion's corrective action program (CR-03-09838), this violation is treated as a non-cited violation (NCV), consistent with Section VI.A.1 of the NRC Enforcement Policy. **(NCV 05000336/2004005-04)**

3. (Closed) URI 05000423/2003004-02, Fire Safe Shutdown Strategy May Not Be Adequate for Fire Scenarios Which Assume Loss of All AC Power

An Unresolved Item (URI) was opened in Inspection Report 05000423/2003004 to track this issue pending the resolution of NRC questions to evaluate potential licensee performance issues and assess the risk significance of the condition. As a result of this review, a licensee-identified violation of very low safety significance (Green) was identified, for inadequate fire safe shutdown strategies contributing to the failure to meet safe shutdown requirements integral with the fire protection program requirements in accordance with License Condition 2.H, "Fire Protection," License No. NPF-49.

On January 16, 2003, Dominion identified that existing fire safe shutdown strategies were not sufficient in response to fire scenarios that assume a loss of all AC power. Specifically, that in response to postulated fires in the control room, cable spreading room, and instrument rack rooms, current safe shutdown strategies would not properly respond to the pressure/temperature conditions in the reactor coolant pump (RCP) seal #1 leakoff lines and their failure. While this issue relates to an original plant design attribute, i.e., the lack of reactor coolant system (RCS) pressure rated piping in the seal return piping, the licensee also did not recognize that the air-operated valve in the seal leakoff piping, assumed to be closed to support Westinghouse Loss-of-Seal-Cooling analyses, would, in fact, fail open, as designed, in response to loss of power or instrument air. As a result, for the events described above, Dominion concluded that the seal leakoff line failure would result in their failure to meet safe shutdown requirements based upon reduced credited makeup capabilities. The finding is more than minor because it is associated with the mitigating systems cornerstone attributes listed in Inspection Manual Chapter 0612, Appendix B, specifically "Protection Against External Factors - Fire." Additionally, the finding affects the mitigating systems cornerstone objective, in that it affects the capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The finding was evaluated using Appendix F of the SDP and through a quantitative analysis of:

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- the existence of a 24 hour per day fire watch in the cable spreading room and the resulting significantly lower likelihood of a fire in this area,
- five fire scenarios that could result in a station blackout without involving three or more independent control cabinet fires,
- the probability that operators will fail to shutdown the reactor from the remote shutdown panel given a control room evacuation.

The analysis resulted in a very small increase in core damage frequency of 6.0×10^{-8} over a one year period, therefore, this finding was considered to have very low safety significance (Green). The enforcement aspects of this violation are discussed in Section 4OA7.

4OA6 Meetings, Including Exit

Occupational Radiation Safety Report Exit Meeting Summary

On January 29, 2004, the inspector presented the Unit 2 and Unit 3 inspection results to licensee management and other staff who acknowledged the findings.

Integrated Report Exit Meeting Summary

On April 20, 2004, the resident inspectors presented the overall inspection results to Mr. J. Alan Price and other members of his staff who acknowledged the findings. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by Dominion and is a violation of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as a Non-Cited Violation.

- License Condition 2.H of facility Operation License Number NPF-49, requires all provisions of the fire protection program to be implemented and maintained, including the ability to achieve and maintain safe shutdown. Contrary to this, on January 16, 2003, the licensee identified that the fire safe shutdown strategy was insufficient in response to fire scenarios that assume a loss of all AC power. This was identified in Dominion's corrective action program as CR-03-00383. This finding is of very low safety significance due to a very small change in core damage frequency.

ATTACHMENT: SUPPLEMENTAL INFORMATION

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SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

S. Alligood, Radiation Protection Technician
T. Armagno, Supervisor, Health Physics
B. Bowen, Radiation Protection Technician
P. Calandra, ALARA Coordinator
W. Collins, Radiation Protection Technician
D. DelCore, Shift Supervisor, Health Physics, Unit 2
D. Dodson, Licensing Manager
J. Grogan, Unit 3, Assistant Operations Manager
I. Haas, Acting Supervisor Exposure Control
W. Hoffner, Operations Manager
A. Johnson, Supervisor, Radiation Protection Support, (Technical)
A. Jordan, Director, Nuclear Engineering
F. Jozwick, Radiation Protection Technician
J. Kunze, Unit 2, Assistant Operations Manager
E. Laine, (Acting) Manager, Radiological Protection & Chemistry
R. McIntosh, Licensing Engineer
P. Parulis, Manager, Nuclear Oversight
A. Price, Site Vice President - Millstone
R. Reading, Radiation Protection Technician
D. Regan, Supervisor, Radiation Protection Support (ALARA)
S. Sarver, Director, Nuclear Station Operations & Maintenance
S. Scace, Director, Nuclear Station Safety and Licensing
R. Sosin, Health Physicist
M. Wood, Health Physicist
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NRC personnel

E. W. Cobey, Senior Reactor Analyst, Division of Reactor Safety (DRS)
K. M. Jenison, Senior Projects Engineer, Division of Reactor Projects
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D. P. Loveless, Senior Reactor Analyst, DRS, Region IV
K. A. Mangan, Resident Inspector
N. T. McNamara, Emergency Preparedness Inspector, DRS
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N. T. Sanfilippo, Reactor Engineer
W. L. Schmidt, Senior Reactor Analyst, DRS
S. M. Schneider, Senior Resident Inspector
R. J. Urban, Enforcement Specialist, Office of the Regional Administrator

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSEDOpened

05000336/2004005-02	URI	Evaluating the adequacy of Unit 2 (1R19)
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Opened and Closed

05000336/2004005-01	NCV	Failure to adequately implement procedures for steam generator feed pump testing which led to a reactor trip (1R14)
05000423/2004005-03	FIN	Failure to implement post maintenance testing to identify improperly performed valve repairs on instrument air dryer system (1R19)
05000336/2004005-04	NCV	Failure to adequately implement vendor technical manual requirements into written procedures which control the alignment and operation of electrical power sources to vital shutdown cooling components (4OA5.2)

Closed

05000336/2003004-00	LER	Reactor Coolant System (RCS) Pressure Boundary Leakage Event (4OA3.1)
05000336/2003006-00	LER	Two Manual Reactor Trips due to Turbine Trips caused by Turbine Vibrations (4OA3.2)
05000336/2003010-02	URI	Loss of Shutdown Cooling When AC Supply Sources Were Paralleled Out Of Phase (4OA5.2)
05000423/2003004-02	URI	Fire Safe Shutdown Strategy May Not Be Adequate for Fire Scenarios Which Assume Loss of All AC Power (4OA5.3)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

DWG 25242-30294, Diesel Enclosure Ventilation System Diesel Generator Enclosure "B"
Temperature Control
DWG 12179-FM-150C, Revision 22, Turbine Plant Ventilation
CR-04-00610, "B" EDG Room Temperature Controller 3HVP*TIC29B not Controlling at Setpoint
Temperature of 75 DEGF

Section 1R04: Equipment Alignment

FSAR Chapter 6.3, ECCS
OPS Form 3308-4, Revision 3, Change 2, Train B High Pressure Safety Injection
High Pressure Safety Injection Piping and Instrumentation Drawing (P&ID)
DWG 12179-EM-117A-23, Emergency Generator Fuel Oil System
DWG 12179-EM-116A-40, Emergency Generator A Lube Oil and Cooling Water
DWG 12179-FM-117A-23, Emergency Generator A Starting Air System
DWG 25203-26005, Condensate Storage and Auxiliary Feedwater
SP-2604A, Revision 012-09, HPSI Pump Operability and Inservice Testing, Facility 1
SP-2604F-001, HPSI System Electrical Alignment Check, Facility 2
SP-2604F-002, Revision 015-02, HPSI System Valve Alignment Check, Facility 2
SP-2613A-002, Revision 016-02, Diesel Generator Valve Alignment Checklist, Facility 1
OP-2308, Revision 011-03, High Pressure Safety Injection System
OP-2346A, Revision 021-02, Emergency Diesel Generator
OP-2346A, Revision 024-06, Emergency Diesel Generator

Section 1R05: Fire Protection

Operability Determination, MP2-060-03 for CR-03-09580
M2-EV-03-0046, Technical Evaluation for Assessment of Vital Switchgear Compensatory
Measures Operability Given October 2003 Ventilation System Ventilation Flow Test
Results and Conditions Identified in CR-03-09574, CR03-09580, CR-03-09043, and
CR-03-06337
CR-03-11744, Questions Raised On East 480 VAC Switchgear Compensatory Ventilation
CR-03-12637, Compensatory Actions of OD-MP2-060-03 Do Not Address Requirements of
Operating License as Identified in Fire Protection Program Reviews
CR-04-02016, Difference Exists in Acceptance Criteria for Fire/Smoke Dampers between Unit 2
Surveillance Procedures
CR-04-01828, Fire Watch Extinguisher Found Outside Monthly Inspection Date
CR-04-01783, Some Fire Watches May Not Be Fully Aware of their Responsibilities
Millstone Unit 2 Fire Hazards Analysis - Auxiliary Building DC Equipment Room "B" West, Fire
Area A-21
FP-EV-99-0015, Technical Evaluation for Penetrations in the Service Water Pipe Tunnel
(ceiling) App. R Fire Barrier Interface Areas on Elevation 14'6", Millstone Unit 2
FP-EV-99-0006, Technical Evaluation for the Condition of Fire Dampers 2-HV-155A,

2-HV-155B, 2-HV-155C, 2-HV-156A, 2-HV-156B, 2-HV-156C in Auxiliary Building 14'6"
Elevation Fire Zones A-12A, A-20, and A-21
FP-EV-99-0005, Technical Evaluation for the Configuration of Fire Dampers 2-HV-601A and
2-HV-601B in the Floor of the Auxiliary Building 25'6" Elevation Cable Vault, Millstone 2
FP-EV-99-0002, Technical Evaluation for Expansion Joints in Fire Barriers, Millstone Unit 2
FP-EV-98-0042, Technical Evaluation for the Separation of Millstone Unit 2 Turbine Building
and Unit 1 Turnover Areas/Turbine Building
SP-2413, Revision 004-03, DC Switchgear Room Duct Detector Operability Test
Millstone Nuclear Power Station-Unit 3, Fire Protection Evaluation Reports, December 2001
Material Safety Data Sheet No. 2, Diesel Fuel
National Fire Protection Association Code
DWG 25212-24279-ES026A, Revision 1, Millstone Nuclear Power Station Unit #3 Penetration
Map Engineering Safety Facility EI 21'6"
FPI 50-001, Rev 009, Fire Brigade Drill Assessment Data Sheet
CR-04-00896, Issues Identified While Conducting Station Fire Drill
SFP-17, Revision 001-01, Fire Penetration Seal Inspections
SFP-10, Revision 003, Fire Prevention Inspections
Emergency Generator Enclosure Stops and Seals Drawings - Unit 3

Section 1R06: Flood Protection Measures

Calculation 12179-P(R)-1073, Revision 0, Change 02, Maximum Flood Levels and Effect on
Safety Related Equipment in the Diesel Generator Building
Calculation 12179-P(R)-1198, Revision 0, Change 1, Flood Source Termination Evaluation
CR-04-02937, Documentation Discrepancies in MP3 Flooding Calculations for EDG

Section 1R07: Heat Sink Performance

AWO M2-03-09338, "C" RBCCW Heat Exchanger Inspection
CR-04-02862, 2-SW-92B failed IST set pressure testing of 2702f3

Section 1R11: Licensed Operator Requalification Program

MC-02308, Estimated Critical Conditions (ECC) Module
MC-04207L, Nuclear Instrumentation
EOP 2540, Functional Recovery (draft procedure)
MP-26-EPI-FAP06, Rev 000-05, Classification and PARS

Section 1R12: Maintenance Implementation

Millstone Unit 3 Maintenance Rule Scoping Tables
Millstone Unit 2 Maintenance Rule Scoping Tables
CR-03-11600, Reactor Cavity Draindown Without Wide Range RCS Level Instruments in
Operation
CR-04-00953, "A" CDS Chiller tripped during Chiller Swap
CR-04-01129, AOP 3562 Entry Due to Instrument Air Dryer Failure

CR-04-02256, Entry Into AOP 3555, RCS Leak, While Placing Deborating Demineralizer in Service
CR-04-00759, Z2 CRAC Cools the Control Room Well Below the Thermostat Setpoint Making Room Very Uncomfortable and Possibly Affecting Some Instrumentation
CR-04-00929, CRAC Fails to Cool the Control Room Adequately
CR-04-02627, #1 Feed Regulating Valve Controller will not Shift to Manual
Maintenance Rule Functional Failure Evaluation for CR 04-02256
MP-24-MR-FAP730, Revision 0-01, Maintenance Rule Goal Setting and Monitoring
MP-24-MR-FAP710, Revision 000-02, Maintenance Rule Functional Failures and Evaluations
AOP-2578, Revision 006-01, Loss of Refueling Pool and Spent Fuel Pool Level
AOP-2572, Revision 009, Loss of Shutdown Cooling
NUMARC 93-01, Revision 2, NEI Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants

Section 1R13: Maintenance Risk Assessments and Emergent Work Evaluation

Work schedule on 01/22/04, Maintenance and Testing of Facility 2 Control Room Air Conditioning and Calibration of "B" Linear Power Range Drawer
Work schedule on 01/23/04, Maintenance and Testing of "B" EDG, Containment Isolation Valves, and Solid State Protection System Testing
Work schedule on 02/10/04, Maintenance and Testing of "C" Charging Pump, "B" Hydrogen Analyzer, "B" EBFS Damper, Auto Auxiliary Feedwater Test, Offsite Power Line and SBO Diesel
SP-2613A, Revision 021-01, Diesel Generator Operability Tests, facility 1
PRA Red Condition Contingency/Compensatory Plan
EOP 2520, Revision 12, Loss of Offsite Power/Loss of Forced Circulation
MP-20-WM-SAP02, Revision 1, On-Line Maintenance
MP-20-WM-FAP02.1, Revision 008, Conduct of On-Line Maintenance
OP-2343, Revision 020-02, 4160 Volt Electrical System
NUMARC 93-01, Revision 2, Industry Guidelines for Monitoring Effectiveness of Maintenance at Nuclear Power Plants
Major Equipment Schedule
Equipment Out of Service Quantitative On-Line Risk Tool
Control Room Logs

Section 1R14: Personnel Performance During Non-Routine Plant Evolutions

SP-2659, Revision 009, Steam Generator Feed Pump Periodic Testing
SP-2659 Steam Generator Feed Pump Periodic Testing Canned Brief
SP-3621.4, Revision 000, Main Feedwater Turbine Emergency Governor and Trip Lockout Test
SW Dwg. 12179-EM-104A-44, Chemical and Volume Control
SW Dwg. 12179-EM-104B-17, Chemical and Volume Control
SW Dwg. 12179-EM-104C-30, Chemical and Volume Control
SW Dwg. 12179-EM-110A-12, Radioactive Solid Waste
SW Dwg. 12179-EM-110B-18, Radioactive Solid Waste
Drawing No. 25203-29236, Sh. 10, Rev A, GE Dual Front Standard Hydraulic Schematic

M3-EV-01-0045, CVCS System - OP 3304A Procedure Change to Support 3RCS*LCV 460 Repair
OP-3304A, Revision 28-05, Charging and Letdown
CR-04-02256, Entry Into AOP 3555, RCS Leak, while placing Deborating Demineralizer in Service
CR-04-00146, During Performance of SP 3602A.1, "Rod Cluster Control Exercise" Reactivity change was greater than expected
CR-04-01824, Stator Cooling Leak on Rectifier Bank 4
CR-04-02446, Unit 2 Reactor Trip following "B" SGFP Trip
AOP 3555, RCS Leak
MP-16-OE-SAP01, Revision 000, Operating Experience Program
MP-16-OE-FAP01, Revision 000, Operating Experience Evaluations
MP-14-OPS-GDL200, Revision 000, Conduct of Operations
Control Room Logs
EOP-2525, Revision 20, Standard Post Trip Actions
EOP-2526, Revision 15, Reactor Trip Recovery
TS 3.3.2, Engineered Safety Feature Actuation System Instrumentation
ARP-2595A, Revision 000-03, Alarm Response for SGFP Related PPC Alarms
ARP-2590E, Revision 008-12, Turbine Vibration HI HI
Non-Emergency Report Form dated 3/6/04, "B" Steam Generator Feed Pump Tripped, Would Not Reset. Manual Reactor Scram Based on Lowering Steam Generator Levels
Sequence of Events Millstone Unit 2 Reactor Trip March 15, 2004
Memorandum, March 17, 2004, Management Readiness Review Prior to U2 Reactor Startup

Section 1R15: Operability Evaluations

CR-04-00728, During Charging Pump Swap From 3CHS*P3A to 3CHS*P3B, it was observed that 3HVR*FN14A/13A started automatically with 3HVR*FN14B/13B still running
CR-04-01022, 3TME-MOV35 Found to be in the Closed Position, OP 3323D Indicates that the Valve Should be Open
CR-04-02228, Service Water Leak in the 2" branch line to valve 3SWP*MOV115A
CR-04-02021, 3IAS-E1B after cooler packing leak would not stop after adjustments were made
CR-04-02273, Packing received for 3IAS-E1B is different from Original packing
CR-04-02627, #1 Feed Regulating Valve Controller will not Shift to Manual
CR-04-01593, Particulate Sample for 3BGF-TK2 was High Out of Spec
CR-03-08579, Load Cables from the Facility Z2 Circuit Breakers Have Blistered Outer Jackets Where the Cable Penetrates to the Cable Vault Above
CR-04-01647, Low Pre-Charge Pressure Suspected in Pulsation Dampers L11 "B" and "C"
CR-04-01850, Gaseous Effluent Radiation Monitor Response Factors Need to be Adjusted for Pressure Error
CR-04-03014, MP2 Main Feed Regulating Valve Leakage Greater than Assumed in FSAR Section 14.8.2 Containment Pressurization Analysis
DWG 12179-FM-148A-38, Reactor Plant Ventilation
DWG NO 12179-EM-124B-13, Extraction Steam And TG Gland Seal and Exhaust
OP-3353.MB6B, Revision 003-7, Main Board 6A - Alarm Response Procedure
OP-3353.MB7A, Revision 002-4, Main Board 7A - Alarm Response Procedure
AOP 3559, Revision 6, Loss of Condenser Vacuum

WC 2, Revision 006-05, Tagging
OD MP3-063-04 MP3, Service water system leaks in brazed joints in supply to circulation water pumps
OD MP2-063-04, Low Pre-Charge Pressure Suspected in Clogging Pump Pulsation Dampers
OD Closure Request MP2-063-04, Low Pre-Charge Pressure Suspected in Charging Pump Pulsation dampeners
OD MP2-064-04, Gaseous Effluent Radiation Monitor Response Factors Need to be Adjusted for Pressure Error
RP-5, Revision 003, Operability Determinations
FSAR Chapter 14, Safety Analysis

Section 1R16: Operator Work-Arounds

Unit 3 Ops KPI (Key Performance Indicators) Info Week ending 2-29-2004
Unit 2 Ops KPI Info Week ending 3-22-2004
COP 200.9, Operational Performance Status

Section 1R17: Permanent Plant Modifications

Condition Report Engineering Disposition Form for CR-04-02168 and associated drawings
CR-04-02168, Feed Pump Trip Actuation Switch is Sensitive to Physical Agitation

Section 1R19: Post-Maintenance Testing

ICD 3.02, Spent Fuel Pool level instrument LS-7424 Loop Instrument Calibration Data (ICD) sheet dated 6/30/2003
AWO M3-01-10422, Service Water Pump
AWO M3-03-01618, Service Water Pump
AWO M3-03-13442, Service Water Pump 1C Motor
AWO M3-03-10656, Quench Spray Pump
AWO M3-04-01359, Instrument Air Dryer Outlet Isolation
AWO M2-03-14346, #1 Steam Generator Atmospheric Dump Control Valve Assembly
AWO M2-03-06688, "C" Charging Pump Assembly 3 Month Coupling Inspection Lubrication
AWO M2-04-00989, Control Room Vent Control Cabinets
AWO M3-03-03418, Control Building Air Conditioning Outlet Valve 35SWP*TV35A Inspection and Testing
AWO M2-03-15271, "A" Auxiliary Feedwater (AFW) Pump Assembly Bearing
AWO M2-03-01738, "A" AFW Pump Check Valve 2-FW-32A
AWO M2-04-00268, "A" Service Water Pump Packing Replacement
AWO M2-04-00159, "A" Service Water Pump Bearing Oil
AWO M2-01-15843, Enclosure Building Filtration System Fuel Handling Exhaust Motor Operated Damper
CC 1, Revision 004, Control of Chemical Consumable Products
CR-04-01129, AOP 3562 Entry Due to Instrument Air Dryer Failure
CR-04-01104, "A" Service Water Pump Alignment Out of Specification
CR-02-00258, Hole Found Drilled in Enclosure Building Filtration System (EBFS) Damper

CR-04-01626, Spent Fuel Pool Platform Crane Parts Loose not Restrained in accordance with foreign material exclusion (FME) Controls
CR-03-12103, Control Room Reported Water Dripping from Bottom of Insulation on 2-MS-190A
CR-03-00186, Less than Optimal Grease is Being Utilized in the High Speed Coupling and Low Speed Couplings on the U2 Charging Pumps
DWG NO 12179-EM-138A-26, Compressed Air
DWG NO 12179-EM-138B-35, Compressed Air
MP-20-WP-GDL40, Revision 002-01, Pre- and Post-Maintenance Testing
AOP 3562, Revision 4, Loss of Instrument Air

Section 1R20: Refueling and Outage Activities

OP-2201, Revision 029-02, Plant Heatup
OP-2202, Revision 020-04, Reactor Startup IPTE
OP-2203, Revision 016-08, Plant Startup
OP-2272C, Revision 000-01, Plant Operation in Mode 3 Prior to Reactor Startup
MP-20-OM-GDL01, Rev. 000, Forced Outage Management Guideline
Event Review Team Report dated March 7, 2004
Event Review for Automatic Reactor Trip, Unit 2, on March 15, 2004
Technical Specifications applicable to Modes 1, 2, 3
SORC #MP-04-012, Event Review for Manual Reactor Trip Unit 2 on March 6, 2004
CR-04-02168, Feed Pump Trip Actuation Switch is Sensitive to Physical Agitation
CR-04-02152, Review of Post Rx Trip Data Indicates 2 Main Steam Safety Valves Opened
CR-04-02154, Trending CR for Main Steam Safety Valve Opening After Reactor Trip at Millstone 2
Feed System Piping and Instrument Diagram
Estimated Critical Position Data

Section 1R22: Surveillance Testing

SP-2610A, Revision 001-06, Motor Driven AFP and Recirculation Check Valve IST, Facility 2
OPS Form 2610A-002, Revision 007-01, Motor Driven AFW Pump Operability Test, Facility 2
SP-3446B12, Revision 011-03, Train "B" Solid State Protection System Operational Test
SP-2604A, Revision 012-09, HPSI Pump Operability and Inservice Testing, Facility 1
SP-2609A, Revision 013-05, EBFS and Control Room Ventilation Operability Test, Facility 1
SP-2613K, Revision 002-5, Diesel Generator Slow Start Operability Test, Facility 1
SP-2401GB, Revision 002-02, RPS Channel "B" Bistable Trip Test
SP-3626.6, Revision 012-04, Service Water Pump 3SWP*P1C Operational Readiness Test
SP-31005A, Revision 001-03, Moderator Temperature Coefficient and Power Coefficient Measurements, Power Exchange Method
SP-3646A.8, Revision 19-04, Slave Relay Testing
SP-3646A.8-010, Revision 001, Containment Isolation Phase A S920 - Relay K630, Slave Relay Actuation
SP-3622.2-001, Revision 13-001, Auxiliary Feed Pump 3FWA*P1B Operational Readiness Test
SP-3622.3-001, Revision 13-002, TDAFW Pump Operational Readiness Test

SP-2609E, Revision 008-02, EBFS Negative Pressure Test
SP-2609C, Revision 6, Enclosure Building Operability
SP-2610B-004, Revision 000-08, TDAFP and Recirculation Check Valve IST
SP-2610B-001, Revision 013-03, TDAFP Operability Test and 2-MS-464 (SV-4188) Stroke and Timing IST
OP-3622.2, Revision 015-04, Auxiliary Feedwater Pump 3FWA*P1B Operational Readiness Test
OPS Form 2604A-001, Revision 012, "A" HPSI Pump Operability Test, Mode 1, 2, 3, and 4
OPS Form 2604A-003, Revision 002-03, "A" HPSI Pump IST
Surveillance Form SP-3626.6-001, Revision 013-03, Service Water Pump 3SWP*P1C Operational Readiness Test
ENG Form 31121-036, Revision 004, 3SWP*P1C IST Pump Test Plan
TS 3.3.1, Reactor Trip System Instrumentation (Action 10)
TS 3.3.2, Engineered Safety Features Actuation System (Action 14)
TS 3.3.3.5, Remote Shutdown Instrumentation
TS 3.5.2, ECCS Subsystems - $T_{avg} \geq 300^{\circ}\text{F}$
TS 3.7.1.2 and Bases, Auxiliary Feedwater Pumps
TS 3.7.4 and Bases, Service Water System
TS 4.0.5., Inservice Inspection and Testing
AWO M3-03-1378S, Troubleshooting Sheet for Troubleshooting Steps in the Event of a Fault in the RCP Underspeed Trip Logic
Major Equipment Schedule

Section 1R23: Temporary Plant Modifications

TM-2-04-001, EHC Fluid Collection for Electro-Hydraulic Control (EHC) Fluid Leak in Front Standard
TM-5-02-004, Disable Electrical Reset of Makeup Batch Counters
OP 3304C, Revision 020-05, Primary Makeup and Chemical Addition
DWG 25212-32001, Revision 12, Reactor Coolant Makeup Control Auxiliary Circuit

Section 2OS1: Access Control to Radiologically Significant Areas

RPM 1.3.8, Revision 8, Criteria for Dosimetry Issue
RPM 1.4.1, Revision 7, ALARA Reviews and Reports
RPM 1.4.2, Revision 2, ALARA Engineering Controls
RPM 1.4.4, Revision 2, Temporary Shielding
RPM 1.5.2, Revision 4, High Radiation Area Key Control
RPM 1.5.5, Revision 4, Guidelines for Performance of Radiological Surveys
RPM 1.5.6, Revision 3, Survey Documentation and Disposition
RPM 2.1.1, Revision 5, Issuance and Control of RWPs
RPM 2.1.2, Revision 2, ALARA Interface with the RWP Process
RPM 2.4.1, Revision 3, Posting of Radiological Control Areas
RPM 5.2.2, Revision 10, Basic Radiation Worker Responsibilities
RPM 5.2.3, Revision 3, ALARA Program and Policy
RPM-GDL-008, Revision 0, Electronic Dosimeter Alarm Set Points

MP-02-NO-GDL110, Revision 0, Oversight by Nuclear Specialists
EN 31013, Revision 2, Spent Fuel Pool Operations
SP 31014, Revision 5, Boral Test Coupon Procedure

Nuclear Oversight Audit

Audit MP-03-A14, Radiation Protection & Chemistry
2R15 Outage Assessment, October-November 2003

Condition Reports

03-11461, 03-11689, 03-11659, 03-11816, 03-12498, 03-12560, 03-12608, 03-12905, 03-12252, 03-10255, 03-11159

ALARA Council Meeting Notes

Meeting conducted on 11/18/03, 11/06/03, 12/16/03

Section 40A1: Performance Indicator Verification

LERs

Maintenance Rule Unavailability Tables

MP3 PI-DVS 5, MP 3 Safety system Unavailability (SSU) - Emergency Diesel Generator
Docket Nu 50-423-B18343, Millstone Power Station, Unit No. 3 Technical Specifications
Change Request 3-2-00, Emergency Diesel Generator Allowed Outage Time, and Responses

LIST OF ACRONYMS

AFW	auxiliary feedwater
ALARA	as low as reasonably achievable
Δ CDF	change in core damage frequency
CDS	control drive system
CFR	Code of Federal Regulation
CRs	condition reports
CRAC	control room air conditioning
EAL	emergency action level
EBFS	enclosure building filtration system
ECCS	emergency core cooling system
EDG	emergency diesel generator
EHC	electro-hydraulic control
EOOS	equipment out of service
EOP	emergency operating procedure
FSAR	Final Safety Analysis Report
HDR	high dose rate
HPSI	high pressure safety injection
HRA	high radiation area
IMC	inspection manual chapter
IST	inservice testing
LER	licensee event report
Δ LERF	change in large early release frequency
LHRA	locked high radiation areas
LOI	loss of inventory
LORHR	loss of residual heat removal (shutdown cooling for Unit 2)
LPSI	low pressure safety injection
MDAFW	motor driven auxiliary feedwater
MR	maintenance rule
NCV	non-cited violation
NRC	Nuclear Regulatory Commission
OP	operating procedure
OWA	operator work-arounds
PCR	personnel contamination report
PEO	plant equipment operator
PI	performance indicator
PMT	post maintenance testing
PWSCC	primary water stress corrosion cracking
RCA	radiologically controlled area
RCP	reactor coolant pump
RCS	reactor coolant system
RG	Regulatory Guide
RPS	reactor protection system
RSPS	risk significant planning standards
RWP	radiation work permit
SDC	shutdown cooling

SDP	significance determination process
SIH	safety injection-high
SP	surveillance procedure
SFP	spent fuel pool
TDAFW	turbine driven auxiliary feedwater
TI	temporary instruction
TS	technical specification
URI	unresolved item
VAC	voltage alternating current
VHRA	very high radiation area