

January 14, 2009

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

SUBJECT: MILLSTONE POWER STATION, UNIT 2 - NRC TRIENNIAL FIRE  
PROTECTION INSPECTION REPORT 05000336/2008008

Dear Mr. Christian:

On December 5, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Millstone Power Station, Unit 2. The enclosed inspection report documents the inspection results, which were discussed on December 5, 2008, with Mr. Skip Jordan and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations, and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, the NRC identified two findings of very low safety significance (Green) that were violations of NRC requirements. However, because of their very low safety significance and because they are entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest any NCV 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.

In accordance with Title 10 of the Code of Federal Regulations Part 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of the NRC's document system (ADAMS).

Mr. David A. Christian

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(the Public Electronic Reading Room).

Sincerely,

**/RA/**

John F. Rogge, Chief  
Engineering Branch 3  
Division of Reactor Safety

Docket No. 50-336  
License No. DPR-65

Enclosure: Inspection Report No. 05000336/2008008  
w/Attachment: Supplemental Information

Mr. David A. Christian

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.: 05000336

License No.: DPR-65

Report No.: 05000336/2008008

Licensee: Dominion Nuclear Connecticut, Inc.

Facility: Millstone Power Station, Unit 2

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

Dates: November 17, 2008 – December 5, 2008

Inspectors: D. Orr, Senior Reactor Inspector, DRS  
M. Halter, Reactor Inspector, DRS  
E. Huang, Reactor Inspector, DRS

Approved by: John F. Rogge, Chief  
Engineering Branch 3  
Division of Reactor Safety

## SUMMARY OF FINDINGS

IR 05000336/2008008; 11/17/2008 - 12/05/2008; Dominion Nuclear Connecticut, Inc.; Millstone Power Station, Unit 2; Triennial Fire Protection Team Inspection, Fire Protection.

This report covered a two-week triennial fire protection team inspection by specialist inspectors. Two Green NCVs 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," Rev. 4, dated December 2006.

### A. NRC-Identified and Self-Revealing Findings

#### **Cornerstone: Mitigating Systems**

Green. The team identified that Dominion failed to administratively control and ensure the availability of all necessary fire safe shutdown equipment to perform manual actions in the 4kV upper switchgear room. This finding was determined to be of very low safety significance (Green) and a NCV of the Millstone Nuclear Power Station, Unit 2 Operating License condition 2.C.(3), Fire Protection.

The team determined that this finding was more than minor because it was associated with the external factors attribute (fire) of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, Dominion did not ensure that an electrical flash jacket necessary to perform local breaker operations was available in the upper 4kV switchgear room. Actions to restore the A diesel generator would have been delayed for a fire in the lower 4kV switchgear room. The team assessed this finding in accordance with NRC IMC 0609, Appendix F, Fire Protection Significance Determination Process. This finding affected post-fire safe shutdown systems. This finding screened to very low safety significance (Green) in Phase 1 of the SDP because it was assigned a low degradation rating. A low degradation rating was assigned because additional electrical flash jackets were onsite and the local breaker operations would likely have been performed within 3 hours. The safe shutdown analysis most restrictive timeline for a fire in the lower switchgear room required a charging pump restored within 3 hours for reactor coolant system makeup. Local breaker operations in the upper 4kV switchgear room would be needed to support ac power to a charging pump. The team determined that this finding had a cross cutting aspect in the area of human performance because personnel did not return an electrical flash jacket to its proper storage location even though it was clearly labeled for the upper 4kV switchgear room. (H.4(b)) (Section 1R05.01)

Green. The team identified that Dominion failed to ensure that a post-fire manual action to restore auxiliary feedwater (AFW) flow to a steam generator (SG) would be performed within 30 minutes of a plant trip consistent with the Millstone Unit 2 fire safe shutdown analysis. This finding was determined to be of very low safety significance (Green) and a

NCV of the Millstone Nuclear Power Station, Unit 2 Operating License condition 2.C.(3), Fire Protection.

The team determined that this finding was more than minor because it was associated with the external factors attribute (fire) of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, a timely manual action to restore AFW to SG 1 within 30 minutes of the plant trip for a fire in Fire Area R-2 was not ensured for all circumstances and was validated by Dominion in 1999 to take at least 40 minutes. This finding was similar to more than minor example 3.i in NRC Inspection Manual Chapter (IMC) 0612, Power Reactor Inspection Reports, Appendix E, Examples of Minor Issues. The team assessed this finding in accordance with NRC IMC 0609, Appendix F, Fire Protection Significance Determination Process. This finding affected post-fire safe shutdown systems. This finding screened to very low safety significance (Green) in Phase 1 of the SDP because it was assigned a low degradation rating. A low degradation rating was assigned because Dominion performed a sensitivity analysis of S-02824-S2, Millstone Unit 2, R-2 Fire, Appendix R Analysis, Rev. 2, and determined that restoring AFW flow to steam generator 1 could be delayed for 50 minutes and result in acceptable plant performance during a safe shutdown event. (Section 1R05.01)

B. Licensee-Identified Violations

None.



## REPORT DETAILS

### Background

This report presents the results of a triennial fire protection inspection conducted in accordance with NRC Inspection Procedure (IP) 71111.05T, "Fire Protection." The objective of the inspection was to assess whether Dominion Nuclear Connecticut, Inc. (Dominion) has implemented an adequate fire protection program and that post-fire safe shutdown capabilities have been established and are being properly maintained at the Millstone Power Station, Unit 2. The following fire areas and fire zones were selected for detailed review based on risk insights from the Unit 2 Individual Plant Examination of External Events:

- R-1, A-24
- R-2, T-8
- R-10, A-21
- R-11, A-28

The inspection team evaluated Dominion's fire protection program (FPP) against applicable requirements which included plant technical specifications, technical requirements manual, Operating License condition 2.C.3, 10 CFR 50.48, and 10 CFR 50 Appendix R. The team also reviewed related documents that included NRC safety evaluation reports, the Final Safety Analysis Report (FSAR), Section 9.10, the fire hazards analysis (FHA), and the post-fire safe shutdown analysis.

Specific documents reviewed by the team are listed in the attachment.

### **1. REACTOR SAFETY**

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

1R05 Fire Protection (IP 71111.05T)

.01 Post-Fire Safe Shutdown From Outside Main Control Room (Alternative Shutdown) and Normal Shutdown

a. Inspection Scope

#### Methodology

The team reviewed the safe shutdown analysis, operating procedures, piping and instrumentations drawings, electrical drawings, the FSAR and other supporting documents to verify that hot and cold shutdown could be achieved and maintained from outside the control room for fires that rely on shutdown from outside the control room. This review included verification that shutdown from outside the control room could be performed both with and without the availability of offsite power. Plant walkdowns were also performed to verify that the plant configuration was consistent with that described in the FHA. These inspection activities focused on ensuring the adequacy of systems selected for reactivity control, reactor coolant makeup, reactor decay heat removal, process monitoring instrumentation, and support systems functions. The team verified that the systems and

components credited for use during this shutdown method would remain free from fire damage. The team verified that the transfer of control from the control room to the alternative shutdown locations would not be affected by fire-induced circuit faults (e.g., by the provision of separate fuses and power supplies for alternative shutdown control circuits).

Similarly, for fire areas that utilize shutdown from the control room, the team also verified that the shutdown methodology properly identified the components and systems necessary to achieve and maintain safe shutdown conditions.

### Operational Implementation

The team verified that the training program for licensed and non-licensed operators included alternative shutdown capability. The team also verified that personnel required for safe shutdown using the normal or alternative shutdown systems and procedures are trained and available onsite at all times, exclusive of those assigned as fire brigade members.

The team reviewed the adequacy of procedures utilized for post-fire shutdown and performed an independent walk through of procedure steps to ensure the implementation and human factors adequacy of the procedures. The team also verified that the operators could be reasonably expected to perform specific actions within the time required to maintain plant parameters within specified limits. Time critical actions, which were verified included restoration of alternating current (AC) electrical power, establishing the remote shutdown panel, establishing reactor coolant makeup, and establishing decay heat removal.

Specific procedures reviewed for alternative shutdown, including shutdown from outside the control room included the following:

- AOP 2579A, Fire Procedure for Hot Standby Appendix R Fire Area R-1, Rev. 009-07;
- AOP 2579AA, Fire Procedure for Cooldown and Cold Shutdown, Appendix R Fire Area R-1, Rev. 004-02;
- AOP 2579B, Fire Procedure for Hot Standby Appendix R Fire Area R-2, Rev. 006-04;
- AOP 2579BB, Fire Procedure for Cooldown and Cold Shutdown, Appendix R Fire Area R-2, Rev. 005-04;
- AOP 2579D, Fire Procedure for Hot Standby Appendix R Fire Area R-11, Rev. 006-06;
- AOP 2579DD, Fire Procedure for Cooldown and Cold Shutdown, Appendix R Fire Area R-11, Rev. 005-04;
- AOP 2579F, Fire Procedure for Hot Standby Appendix R Fire Area R-10, Rev. 006-03;
- AOP 2579FF, Fire Procedure for Cooldown and Cold Shutdown, Appendix R Fire Area R-8 and R-10, Rev. 005-03; and,

- AOP 2579M, Fire Procedure for Hot Standby Appendix R Fire Area R-14, Rev. 006-03.

The team reviewed manual actions to ensure that they had been properly reviewed and approved and that the actions could be implemented in accordance with plant procedures in the time necessary to support the safe shutdown method for each fire area. The team also reviewed the periodic testing of the alternative shutdown transfer capability and instrumentation and control functions to ensure the tests were adequate to ensure the functionality of the alternative shutdown capability.

b. Findings

- .1 Introduction. The team identified that Dominion failed to administratively control and ensure the availability of all necessary fire safe shutdown equipment to perform manual actions in the upper 4kV switchgear room. This finding was determined to be of very low safety significance (Green) and a NCV of the Millstone Nuclear Power Station, Unit 2 Operating License condition 2.C.(3), Fire Protection.

Description. On November 20, 2008, the team observed operators walkthrough portions of AOP 2579A, Fire Procedure for Hot Standby Appendix R Fire Area R-1, Rev. 009-07. Attachment 6 of AOP 2579A required operators to perform manual 4kV and 6.9kV breaker operations in the upper 4kV switchgear room and necessitated that an electrical flash jacket, as well as other protective gear be worn while conducting local breaker operations. The team noted that an electrical flash jacket was missing from its assigned locker. Dominion investigated the missing electrical flash jacket and discovered that it was left in the lower 4kV switchgear room. Dominion believed that the electrical flash jacket was likely left in the lower 4kV switchgear room during the week of November 10, 2008, when local breaker operations were performed to support on-line maintenance activities. The electrical flash jacket was clearly marked as belonging to the upper 4kV switchgear room.

Dominion maintained two electrical flash jackets for operator use at Unit 2, and both were stored in the lower 4kV switchgear room from about November 10, 2008 to November 20, 2008. Other electrical flash jackets were maintained on site, such as at Unit 3, but their locations would have delayed local breaker operations in the upper 4kV switchgear room. An electrical fire in the lower 4kV switchgear room would have required operators to locate an electrical flash jacket from outside the Unit 2 designated safe shutdown areas to complete manual breaker operations in the upper 4kV switchgear room.

Dominion promptly relocated the electrical flash jacket to the upper 4kV switchgear room. Dominion also documented this issue in corrective action program condition report CR 119667 and initiated a review of administrative controls to ensure an electrical flash jacket was always maintained in each 4kV switchgear room. The team determined that failing to administratively control and ensure all necessary fire safe shutdown equipment available to perform manual actions in the upper 4kV switchgear room is a performance deficiency.

Analysis. The team determined that this finding was more than minor because it was associated with the external factors attribute (fire) of the mitigating systems cornerstone

objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, Dominion did not ensure that an electrical flash jacket necessary to perform local breaker operations was available in the upper 4kV switchgear room. Actions to restore the A diesel generator would have been delayed for a fire in the lower 4kV switchgear room.

The team assessed this finding in accordance with NRC IMC 0609, Appendix F, Fire Protection Significance Determination Process. This finding affected post-fire safe shutdown systems. This finding screened to very low safety significance (Green) in phase 1 of the SDP because it was assigned a low degradation rating. A low degradation rating was assigned because additional electrical flash jackets were onsite and the local breaker operations would likely have been performed within 3 hours. The safe shutdown analysis most restrictive timeline for a fire in the lower switchgear room required a charging pump restored within 3 hours for reactor coolant system makeup. Local breaker operations in the upper 4kV switchgear room would be needed to provide AC power to a charging pump.

The team determined that this finding had a cross cutting aspect in the area of human performance because personnel did not return an electrical flash jacket to its proper storage location even though it was clearly labeled for the upper 4kV switchgear room. (H.4(b))

Enforcement. Millstone Nuclear Power Station Operating License condition 2.C.(3) requires that Dominion Nuclear Connecticut, Inc. shall implement and maintain in effect all provisions of the Fire Protection Program as described in the approved fire protection program as described in the Final Safety Analysis Report (FSAR). FSAR section 9.10 states in part that the Millstone Nuclear Power Station Fire Protection Program Manual (MP-24-FPP-PRG, Fire Protection Program, Rev. 003-004) has been developed to ensure that any single fire will not prevent the performance of necessary safe shutdown functions. Section 1.3.2 of MP-24-FPP-PRG, Fire Protection Program, Rev. 003-004 defines fire safe shutdown equipment as “Included within this group are the dedicated equipment, tools and consumables required to perform manual action and cold shutdown repair activities for safe shutdown.” Section 4.3.3 of MP-24-FPP-PRG requires administrative control of equipment credited for safe shutdown. Contrary to the above, from about November 10, 2008, until November 20, 2008, Dominion failed to administratively control an electrical flash jacket, equipment credited for safe shutdown for a fire in the lower switchgear room. Because this finding was of very low safety significance (Green) and has been entered into Dominion’s corrective action program (CR 119667), this violation is being treated as a NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy. **NCV 05000336/2008008-01, Failure to Ensure Equipment Necessary For Fire Safe Shutdown Available.**

- .2 Introduction. The team identified that Dominion failed to ensure that a post-fire manual action to restore auxiliary feedwater (AFW) flow to a steam generator (SG) could be performed within 30 minutes of a plant trip consistent with the Millstone Unit 2 fire safe shutdown analysis. This finding was determined to be of very low safety significance

(Green) and a NCV of the Millstone Nuclear Power Station, Unit 2 Operating License condition 2.C.(3), Fire Protection.

Description. Millstone Power Station Unit 2 post-fire safe shutdown analysis, 25203-SP-M2-SU-1046, MP2 Appendix R Compliance Report, Rev. 00, required that AFW flow be restored to a single SG within 30 minutes of the plant trip for a fire in Fire Area R-2. The requirement was derived from analysis S-02824-S2, Millstone Unit 2, R-2 Fire, Appendix R Analysis, Rev. 2. Restoring AFW flow within 30 minutes of the plant trip ensured that SG 1 would not dryout, thereby maintaining decay heat removal and ensuring that pressurizer level indication remained on scale.

M2-SU-1046 also determined that only the Facility Z1 motor driven AFW (MDAFW) pump could be credited for decay heat removal because both the turbine driven AFW (TDAFW) pump and Facility Z2 MDAFW pump were disabled because of the potential of spurious operations. Additionally, procedure AOP 2579B, Fire Procedure for Hot Standby Appendix R Fire Area R-2, Rev. 006-04, included procedure steps to disable the TDAFW pump and the Facility Z2 MDAFW pump. For a Fire Area R-2 fire, operation of diesel generator A (DG A) may be required to support the Facility Z1 MDAFW pump.

On March 17, 1999, operators at Millstone Unit 2 performed a time validation of AOP 2579B, Rev. 4., Attachment 5, Restoring AC Power to Bus 24C and Align Power to Bus 24C from DG A, with a 40 minute completion time. The team noted that the current AOP 2579B revision, Rev. 006-004, maintained the same sequence and manual actions as AOP 2579B, Rev. 4. Considering the 30 minute requirement derived from calculation M2-SU-1046 to restore AFW, the team questioned Dominion's ability to restore AC power in sufficient time to prevent SG 1 dryout.

Dominion reviewed the team's issue and concluded that the local manual actions necessary to restore ac power to bus 24C from DG A could exceed 30 minutes dependent on the initial service water header alignment. Specifically, if Facility Z2 service water pump was initially aligned to the Facility Z1 service water header, DG A would be manually tripped or not started until manual actions to isolate unnecessary service water loads were performed. These actions would be necessary to prevent a runout condition on the Facility Z1 service water pump and to align sufficient service water flow to DG A. Dominion further concluded that DG A would be started in sufficient time to restore AFW flow within 30 minutes from the Facility Z1 MDAFW pump if valve 2-SW-97A, B Service Water Pump Discharge to A Service Water Header, was maintained in its normally closed position.

Dominion promptly issued an operations shift night order to implement technical requirements manual compensatory actions for Fire Area R-2 if 2-SW-97A was maintained open. Dominion also documented this issue in corrective action program condition report CR 121147 and intended to re-perform a time validation of AOP 2579B. The team concluded that failing to ensure that AFW flow would be restored to a SG within 30 minutes consistent with the Millstone Unit 2 post-fire safe shutdown analysis is a performance deficiency.

Analysis. The team determined that this finding was similar to more than minor example 3.i in NRC Inspection Manual Chapter (IMC) 0612, Power Reactor Inspection Reports, Appendix E, Examples of Minor Issues, in that an analysis of S-02824-S2, Millstone Unit 2, R-2 Fire, Appendix R Analysis, had to be re-evaluated to determine the allowable time delay for restoring AFW flow to SG 1. Specifically, the mitigating system cornerstone affected a timely manual action to restore AFW to SG 1 within 30 minutes of the plant trip for a fire in Fire Area R-2. This manual action was not ensured for all circumstances and was validated by Dominion in 1999 to take at least 40 minutes.

The team assessed this finding in accordance with NRC IMC 0609, Appendix F, Fire Protection Significance Determination Process. This finding affected post-fire safe shutdown systems. This finding screened to very low safety significance (Green) in Phase 1 of the SDP because it was assigned a low degradation rating. A low degradation rating was assigned because Dominion performed a sensitivity analysis of S-02824-S2, Millstone Unit 2, R-2 Fire, Appendix R Analysis, Rev. 2, and determined that restoring AFW flow to steam generator 1 could be delayed for 50 minutes and result in acceptable plant performance during a safe shutdown event.

The team determined that this finding did not have a cross cutting aspect because the performance deficiency occurred in 1999 and was not indicative of current licensee performance.

Enforcement. Millstone Nuclear Power Station Operating License condition 2.C.(3) requires that Dominion Nuclear Connecticut, Inc. shall implement and maintain in effect all provisions of the approved fire protection program as described in the Final Safety Analysis Report (FSAR). FSAR section 9.10 states in part that the Millstone Nuclear Power Station Fire Protection Program Manual (MP-24-FPP-PRG, Fire Protection Program, Rev. 003-004) has been developed to ensure that any single fire will not prevent the performance of necessary safe shutdown functions. Section 4.1.2.e. of MP-24-FPP-PRG, Fire Protection Program, Rev. 003-004 ensures the manual actions identified in the Fire Safe Shutdown Compliance Report can be performed under prevailing conditions, and that adequate time, manpower, emergency lighting, and communications are available. Contrary to the above, from about March 17, 1999 until November 20, 2008, Dominion failed to ensure that a manual action, restoring AFW flow, for Fire Area R-2 could be performed under all circumstances within 30 minutes consistent with the Fire Safe Shutdown Compliance Report. Because this finding was of very low safety significance (Green) and has been entered into Dominion's corrective action program (CR 121147), this violation is being treated as a NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy. **NCV 05000336/2008008-02, Failure to Ensure Timely Manual Action Consistent with the Post-Fire Safe Shutdown Analysis.**

.02 Protection of Safe Shutdown Capabilities

a. Inspection Scope

The team reviewed the FHA, safe shutdown analyses and supporting drawings and documentation to verify that safe shutdown capabilities were properly protected. The team ensured that separation requirements of Section III.G of 10 CFR 50, Appendix R were maintained for the credited safe shutdown equipment and their supporting power, control and instrumentation cables. This review included an assessment of the adequacy of the selected systems for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring, and associated support system functions.

The team reviewed Dominion's procedures and programs for the control of ignition sources and transient combustibles to assess their effectiveness in preventing fires and in controlling combustible loading within limits established in the FHA. A sample of hot work and transient combustible control permits were also reviewed. The team performed plant walkdowns to verify that protective features were being properly maintained and administrative controls were being implemented.

b. Findings

No findings of significance were identified.

.03 Passive Fire Protection

a. Inspection Scope

The team walked down accessible portions of the selected fire areas to observe material condition and the adequacy of design of fire area boundaries (including walls, fire doors and fire dampers), and electrical raceway fire barriers to ensure they were appropriate for the fire hazards in the area.

The team reviewed installation/repair and qualification records for a sample of penetration seals to ensure the fill material was of the appropriate fire rating and that the installation met the engineering design. The team also reviewed similar records for the fire protection wraps to ensure the material was of an appropriate fire rating and that the installation met the engineering design.

b. Findings

No findings of significance were identified.

.04 Active Fire Protection

a. Inspection Scope

The team reviewed the design, maintenance, testing, and operation of the fire detection and suppression systems in the selected plant fire areas. This included verification that the manual and automatic detection and suppression systems were installed, tested, and maintained in accordance with the National Fire Protection Association (NFPA) code of record or as NRC approved exemptions, and that each suppression system would control and/or extinguish fires associated with the hazards in the selected areas. A review of the design capability of the suppression agent delivery systems was verified to meet the code requirements for the hazards involved. The team also performed a walkdown of accessible portions of the detection and suppression systems in the selected areas as well as a walkdown of major system support equipment in other areas (e.g. fire pumps, storage tanks and supply system) to assess the material condition of the systems and components.

The team reviewed electric and diesel fire pump flow and pressure tests to ensure that the pumps were meeting their design requirements. The team also reviewed the fire main loop flow tests to ensure that the flow distribution circuits were able to meet the design requirements.

The team assessed the fire brigade capabilities by reviewing training, qualification, and drill critique records. The team also reviewed pre-fire plans and smoke removal plans for the selected fire areas to determine if appropriate information was provided to fire brigade members and plant operators to identify safe shutdown equipment and instrumentation, and to facilitate suppression of a fire that could impact post-fire safe shutdown capability. In addition, the team inspected the fire brigade equipment (including smoke removal equipment) to determine operational readiness for fire fighting.

b. Findings

No findings of significance were identified.

.05 Protection From Damage From Fire Suppression Activities

a. Inspection Scope

The team performed document reviews and plant walkdowns to verify that redundant trains of systems required for hot shutdown are not subject to damage from fire suppression activities or from the rupture of inadvertent operation of fire suppression systems. Specifically, the team verified that:

- A fire in one of the selected fire areas would not directly, through production of smoke, heat or hot gases, cause activation of suppression systems that could potentially damage all redundant safe shutdown trains;



- A fire in one of the selected fire areas (or the inadvertent actuation or rupture of a fire suppression system) would not directly cause damage to all redundant trains (e.g. sprinkler caused flooding of other than the locally affected train); and,
- Adequate drainage is provided in areas protected by water suppression systems.

b. Findings

No findings of significance were identified.

.06 Alternative Shutdown Capability

a. Inspection Scope

Alternative shutdown capability for the areas selected for inspection utilizes shutdown from outside the control room and is discussed in section 1R05.01 of this report.

b. Findings

No findings of significance were identified.

.07 Circuit Analysis

a. Inspection Scope

The team verified that Dominion performed a post-fire safe shutdown analysis for the selected fire areas and the analysis appropriately identified the structures, systems, and components important to achieving and maintaining safe shutdown. Additionally, the team verified that the Dominion's analysis ensured that necessary electrical circuits were properly protected and that circuits that could adversely impact safe shutdown due to hot shorts, shorts to ground, or other failures were identified, evaluated, and dispositioned to ensure spurious actuations would not prevent safe shutdown.

The team's review considered fire and cable attributes, potential undesirable consequences and common power supply/bus concerns. Specific items included the credibility of the fire threat, cable insulation attributes, cable failure modes, and actuations resulting in flow diversion or loss of coolant events.

The team also reviewed cable routing for a sample of components required for post-fire safe shutdown to verify that cable routing was consistent with the assumptions and conclusions of the safe shutdown analyses.

Cable failure modes were reviewed for the following components:

- P18B, B Charging Pump;
- P18C, C Charging Pump;
- P9B, B Auxiliary Feedwater Pump;

- 2-CH-089, Regenerative Heat Exchanger Discharge Isolation Valve; and,
- FI-5277A-1, Auxiliary Feedwater Flow Indicator to Steam Generator 1.

The team reviewed circuit breaker coordination studies to ensure equipment needed to conduct post-fire safe shutdown activities would not be impacted due to a lack of coordination. The team confirmed that coordination studies had addressed multiple faults due to fire. Additionally, the team reviewed a sample of circuit breaker maintenance records to verify that circuit breakers for components required for post-fire safe shutdown were properly maintained in accordance with procedural requirements.

b. Findings

No findings of significance were identified.

.08 Communications

a. Inspection Scope

The team reviewed safe shutdown procedures, the FHA, and associated documents to verify an adequate method of communications would be available to plant operators following a fire. During this review, the team considered the effects of ambient noise levels, clarity of reception, reliability, and coverage patterns. The team also inspected the designated emergency storage lockers to verify the availability of portable radios for the fire brigade and for plant operators. The team also verified that communications equipment such as sound powered phone system cables, repeaters, and transmitters would not be affected by a fire.

b. Findings

No findings of significance were identified.

.09 Emergency Lighting

a. Inspection Scope

The team observed the placement and coverage area of eight-hour emergency lights throughout the selected fire areas to evaluate their adequacy for illuminating access and egress pathways and any equipment requiring local operation and/or instrumentation monitoring for post-fire safe shutdown. The team also verified that the battery power supplies were rated for at least an eight-hour capacity. Preventive maintenance procedures, completed surveillance tests, and battery replacement practices were also reviewed to verify that the emergency lighting was being maintained in a manner that would ensure reliable operation.

b. Findings

No findings of significance were identified.

.10 Cold Shutdown Repairs

a. Inspection Scope

The team verified that Dominion had dedicated repair procedures, equipment, and materials to accomplish repairs of components required for cold shutdown which might be damaged by the fire to ensure cold shutdown could be achieved within the time frames specified in their design and licensing bases. The team verified that the repair equipment, components, tools, and materials (e.g. pre-cut cables with prepared attachment lugs) were available and accessible on site.

b. Findings

No findings of significance were identified.

.11 Compensatory Measures

a. Inspection Scope

The team verified that compensatory measures were in place for out-of-service, degraded or inoperable fire protection and post-fire safe shutdown equipment, systems, or features (e.g. detection and suppression systems and equipment, passive fire barriers, or pumps, valves or electrical devices providing safe shutdown functions or capabilities). The team also verified that the short term compensatory measures compensated for the degraded function or feature until appropriate corrective action could be taken and that Dominion was effective in returning the equipment to service in a reasonable period of time.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES [OA]

4OA2 Identification and Resolution of Problems

.01 Corrective Actions for Fire Protection Deficiencies

a. Inspection Scope

The team verified that Dominion was identifying fire protection and post-fire safe shutdown issues at an appropriate threshold and entering them into the corrective action

program. The team also reviewed a sample of selected issues to verify that Dominion had taken or planned appropriate corrective actions.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

The team presented their preliminary inspection results to Mr. Skip Jordan, Site Vice President, and other members of the site staff at an exit meeting on December 5, 2008. On January 6, 2009, the team leader updated the inspection results to S. Waino and other members of the site staff. No proprietary information was included in this inspection report.

ATTACHMENT: SUPPLEMENTAL INFORMATION

**ATTACHMENT**

**SUPPLEMENTAL INFORMATION**

**KEY POINTS OF CONTACT**

Licensee Personnel

P. Anastas, Nuclear Engineer  
J. Armstrong, Nuclear Engineer  
D. Aube, Supervisor Nuclear Engineering  
C. Chapin, Supervisor Nuclear Shift Operations  
G. Closius, Licensing Lead  
K. Deveau, Inspection Liaison  
A. Elms, Manager Nuclear Engineering  
B. Griffin, Director Nuclear Safety and Licensing  
M. Jalbert, Inspection Liaison  
A. Jordan, Site Vice President  
R. MacManus, Director Engineering  
J. Mangeno, Nuclear Engineer  
P. Raimondi, Nuclear Engineer  
J. Semancek, Operations Manager  
R. Tooker, Inspection Liaison  
S. Waino, Supervisor Nuclear Engineering  
B. Wilkins, Fire Marshall

NRC

J. Rogge, Chief, Engineering Branch 3, Division of Reactor Safety  
W. Schmidt, Senior Reactor Analyst, Division of Reactor Safety  
S. Shaffer, Senior Resident Inspector, Millstone Power Station  
B. Haagensen, Resident Inspector, Millstone Power Station  
J. Krafty, Resident Inspector, Millstone Power Station

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

Opened

None

Opened and Closed

05000336/2008008-01	NCV	Failure to Ensure Equipment Necessary For Fire Safe Shutdown Available
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05000336/2008008-02

NCV

Failure to Ensure Timely Manual Action Consistent with the Post-Fire Safe Shutdown Analysis

Closed

None

Discussed

None

### **LIST OF DOCUMENTS REVIEWED**

#### Fire Protection Licensing Documents

Millstone Unit 2 Facility Operating License, License No. DPR-65  
Millstone Unit 2 Final Safety Analysis Report, Rev. 26.1  
Technical Requirements Manual  
Exemption Letter, Appendix R Exemption for Millstone Unit 2, May 4, 1988  
Safety Evaluation Report, Fire Protection, September 19, 1978  
25203-SP-M2-SU-1046, MP2 Appendix R Compliance Report, Rev. 00  
MP2 Fire Hazards Analysis Report, Rev. 10  
Millstone Unit 2 Fire Hazards Analysis, Rev. 10  
WC-7, Site Fire Protection, Rev. 005-06  
NFPA 90A, Standard for the Installation of Air Conditioning and Ventilation Systems, 1985  
NFPA 90A, Standard for the Installation of Air Conditioning and Ventilation Systems, 1976  
NFPA 80, Standard for Doors and Windows, 1968  
NFPA 12A, Halon 1301 Fire Extinguishing Systems, 1987

#### Calculations/Engineering Evaluation Reports/Design Bases Documents

S-02824-S2, Millstone Unit 2, R-2 Fire, Appendix R Analysis, Rev. 2  
Inadvertent Operation or Rupture of Fire Suppression Systems Report, Dated 1/98  
M2-EV-98-0206, Technical Evaluation for Review of EWR 98066 Fire Protection Improvements Against Fire Protection/Appendix R Requirements and National Fire Protection Association Codes, Dated 10/30/98  
0024-00119-TR-01, Thermo-Lag Assessment Report Vol. 1 and 2, Rev. 1  
FP-EV-99-0019, Technical Evaluation for The Configuration of Fire Dampers 2-HV-265 and 2-HV-333 in West 480V Switchgear Room, Auxiliary Building 36'-6" Elevation, Rev. 1  
FP-EV-98-0002, Technical Evaluation for Potential Loss of HVAC in the East 480V Load Center Room due to a Fire and Subsequent Fire Damper Closure in the West 480V Load Center Room, Rev. 1

#### Design Change Packages

DM2-01-0092-98, Installation of Thermo-Lag Updates for MP2 Electrical Raceways, Dated 5/20/98  
MP2-97-ENG-01912E2, 4.16KV Switchgear Relay Settings, Rev. 0

MP2-E-204-3, 480 Volt Cable Ampacities, Rev. 5  
MP2-98-ENG-02678-E2, Cable Size Assessment for Class 1E Cables and Select Non-Class 1E Cables (4160 VAC, 480 VAC, 120 V Vital AC and 125 V DC), Rev 0  
MP2-98-ENG-02424-E2, Baseline Cable Ampacity Calculation, Rev. 0  
MP2-ENG-ETAP-04014E2, MP2 Electrical Distribution System Analysis, Rev. 0

### Procedures

AOP 2559, Fire, Rev. 007-06  
AOP 2579A, Fire Procedure for Hot Standby Appendix R Fire Area R-1, Rev. 009-07  
AOP 2579AA, Fire Procedure for Cooldown and Cold Shutdown, Appendix R Fire Area R-1, Rev. 004-02  
AOP 2579B, Fire Procedure for Hot Standby Appendix R Fire Area R-2, Rev. 006-04  
AOP 2579BB, Fire Procedure for Cooldown and Cold Shutdown, Appendix R Fire Area R-2, Rev. 005-04  
AOP 2579D, Fire Procedure for Hot Standby Appendix R Fire Area R-11, Rev. 006-06  
AOP 2579DD, Fire Procedure for Cooldown and Cold Shutdown, Appendix R Fire Area R-11, Rev. 005-04  
AOP 2579F, Fire Procedure for Hot Standby Appendix R Fire Area R-10, Rev. 006-03  
AOP 2579FF, Fire Procedure for Cooldown and Cold Shutdown, Appendix R Fire Area R-8 and R-10, Rev. 005-03  
AOP 2579M, Fire Procedure for Hot Standby Appendix R Fire Area R-14, Rev. 006-03  
AOP 2504A, Loss of Non-Vital Instrument Panel VR-11, Rev. 003-13  
AOP 2504B, Loss of Non-Vital Instrument Panel VR-21, Rev. 003-11  
AOP 2504C, Loss of 120 VAC Vital Instrument Panel VA-10, Rev. 003-07  
AOP 2504D, Loss of 120 VAC Vital Instrument Panel VA-20, Rev. 003-06  
AOP 2504E, Loss of 120 VAC Vital Instrument Panel VA-30, Rev. 003-04  
AOP 2504F, Loss of 120 VAC Vital Instrument Panel VA-40, Rev. 003-02  
AOP 2505A, Loss of Vital 125 VDC Bus 201A, Rev. 001-08  
AOP 2505B, Loss of Vital 125 VDC Bus 201B, Rev. 001-05  
AOP 2505C, Loss of Vital 125 VDC Bus 201D, Rev. 1  
AOP 2506A, Loss of Vital 125 VDC Instrument Panel DV10, Rev. 002-04  
AOP 2506B, Loss of Vital 125 VDC Instrument Panel DV20, Rev. 002-05  
AOP 2506C, Loss of Vital 125 VDC Instrument Panel DV30, Rev. 0  
AOP 2506D, Loss of Vital 125 VDC Instrument Panel DV40, Rev. 0  
AOP 2507B, Loss of Non-Vital 125 VDC Distribution Panel D-21, Rev. 001-02  
AOP 2507C, Loss of Non-Vital 125 VDC Distribution Panel D-12, Rev. 001-04  
AOP 2507D, Loss of Non-Vital 125 VDC Distribution Panel D-22, Rev. 001-04  
AOP 2564, Loss of RBCCW, Rev. 004-02  
EOP 2525, Standard Post Trip Actions, Rev. 023  
EOP 2541, Appendix 7, TDAFW Pump Abnormal Startup, Rev. 000-01  
SP 2610BO, TDAFP Tests, Operating, Rev. 000-05  
SP 2618G, Fire Damper Operability Verification, Rev. 005-09  
SP 2619C, Control Room Weekly Checks, Rev. 012-05  
SFP 3, Fire Brigade Equipment Inspection, Rev. 005  
SFP 4, Fire Hose Hydrostatic Testing, Rev. 004-03  
SFP 8, Fire Brigade Radio Test, Rev. 2

SFP 9, Fire Extinguisher Inspection and Maintenance, Rev. 002-03  
SFP 17, Fire Penetration Seal and Barrier Inspections, Rev. 002-02  
SFP 21, Appendix R Fire Cage Inventory, Rev. 002-01  
MP-C MP 782AE, Overcurrent Device Testing for MCC and Molded Case breakers, Rev. 000-06  
MP2720UI, Cold Shutdown Fire Damage Repair Procedure for Fire Area R-1 (Appendix R), Rev. 004-02  
MP2720U3, Cold Shutdown Fire Damage Repair Procedure for Fire Area R-11 (Appendix R), Rev. 004-02

### Completed Tests/Surveillances

SFP 2, Fire Hose Station Inspection, Completed 10/21/08, 9/23/08  
SFP 4, Fire Hose Hydrostatic Test Hose 2-5, Completed 3/4/08  
SFP 4, Fire Hose Hydrostatic Test Hose 2-3, Completed 3/4/08  
SFP 4, Fire Hose Hydrostatic Test Hose 7039, Completed 4/16/08  
SFP 4, Fire Hose Hydrostatic Test Hose 7031, Completed 4/16/08  
SFP 4, Fire Hose Hydrostatic Test Hose 7012, Completed 4/16/08  
SFP 4, Fire Hose Hydrostatic Test Hose 2-5, Completed 12/3/08  
SFP 4, Fire Hose Hydrostatic Test Hose 2-4, Completed 12/3/08  
SFP 4, Fire Hose Hydrostatic Test Hose 2-3, Completed 12/3/08  
SFP 4, Fire Hose Hydrostatic Test Hose 2-2, Completed 12/3/08  
SFP 5, Fire Door Inspection, Completed 1/25/08, 2/23/07  
SFP 6, Fire Protection System Underground Main Flow and Flush Test, Completed 2/22/07, 9/26/03  
SFP-8, Testing of Unit 2 Portable Radio Data Sheet. Rev. 2, Completed 10/8/08  
SFP-8, Testing Appendix 'R' Portable Radios. Rev.1, Completed 5/23/08  
SFP 9, Fire Extinguisher Inspection, Completed 1/08  
SFP 9, Fire Extinguisher Inspection, Building 203 (Unit 2 Turbine Building Cable Vault) 25'0", Completed 1/08  
SFP 9, Fire Extinguisher Inspection, Building 110 (Unit 2 Work control / cable vault mezzanine) 26', Completed 1/08  
SFP 9, Fire Extinguisher Inspection, Building 203 (Unit 2 Turbine building) 54'6", Completed 1/08  
SFP 14, Appendix R Ventilation Fan Speed Check Data Sheet, Completed 6/9/08  
SFP 17, Fire Penetration Seal and Barrier Inspection Group 3, Completed 7/22/05  
SFP 17, Fire Penetration Seal and Barrier Inspection Group 3, Completed 6/24/98  
SFP 17, Fire Penetration Seal and Barrier Inspection Group 3, Completed 12/02  
SFP 17, Fire Penetration Seal and Barrier Inspection Group 6, Completed 3/03  
SFP 17, Fire Penetration Seal and Barrier Inspection Group 6, Completed 8/98  
SFP 17, Fire Penetration Seal and Barrier Inspection Group 8, Completed 3/03  
SFP 17, Fire Penetration Seal and Barrier Inspection Group 8, Completed 8/98  
T88-16, West DC Switchgear Room Halon Fire Suppression System Discharge Test, Completed 2/10/88  
SP 2412B, West DC Switchgear Room Halon Fire Suppression System Functional Test, Completed 9/21/08, 3/19/08  
SP 2601M, Operability Test of Facility 2 Charging Pumps from C-10, Completed 10/16/08  
SP 2604E, Fire Protection System Deluge Nozzle Flow Test, Completed 4/4/06  
SP 2610BO, TDAFP Operational Tests from C-10, Completed 8/30/07



SP 2610E, No. 1 & No. 2 SG Blowdown Isolation Valve Closure Tests from Bottle-up Panels, Completed 8/20/07  
SP 2618C, Fire Protection System Smoke and Heat Detector Test, Completed 10/06/08, 4/4/08  
SP 2618D, Fire Protection System Sprinkler and Deluge Design Function Test, Completed 2/9/08, 9/11/06  
SP 2618G, Fire Damper Operability Verification 2-HV-262, Completed 10/27/08, 6/24/94  
SP 2618G, Fire Damper Operability Verification 2-HV-333, Completed 11/29/01, 6/23/94  
SP 2618G, Fire Damper Operability Verification 2-HV-158, Completed 3/11/89, 7/23/01  
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SP 2618L, TSI Fire Wrap Inspection, Completed 9/12/08, 4/27/07  
SP 2657, Fire Shutdown Storage Box Inventory, Rev. 005-04, Completed 4/1/08  
C SP 600.7, Electric Fire Pump M7-8 Annual Operability Demonstration, Completed 6/10/08, 7/13/07  
C SP 600.7, Electric Fire Pump M7-8 Monthly Operability Demonstration, Completed 10/3/08, 9/5/08  
C SP 600.8, Diesel Fire Pump M7-7 Monthly Operability Demonstration, Completed 10/8/08, 9/12/08  
C SP 600.9, Diesel Fire Pump M7-7 Annual Operability Demonstration, Completed 9/12/08, 7/13/07  
C SP 600.10, Diesel Fire Pump Fuel Oil Storage Tank M7-15 Sample, Completed 9/16/08, 6/24/08  
C SP 600.13, P-82 Electric Fire Pump Monthly Operability Demonstration, Completed 10/17/08, 9/19/08  
C SP 600.14, P-82 Electric Fire Pump Annual Operability Demonstration, Completed 5/28/08, 8/30/07  
FC-246, Fire Endurance Test for Penetration Seal Systems in Precast Concrete Floor Utilizing Silicone Elastomers Carborundum Design, 1977  
Fire Test Reports, Insulation Consultant & Management Service, Inc., 1982  
Project 03-5734-001, Fire Qualification Test on Floor Penetration Seals, 1979

#### Quality Assurance (QA) Audits and Self Assessments

SAR 000506, Triennial Fire Protection Preparation Assessment, Rev. 0  
Nuclear Oversight Audit Checklist 06-04, Fire Protection Program Implementation, Dated 6/21/06  
MP-SA-05-13, Fire Safe Shutdown Multiple Circuit Failure Exposure, Dated 5/31/2005

#### System Health Reports

Safe Shutdown Lighting, 4th Quarter 2007, 3rd Quarter 2008  
Station Electrical Service 4.16KV – Category A, 3<sup>rd</sup> Quarter 2008  
Load Centers – Category A, 3<sup>rd</sup> Quarter 2008  
120 Volt Vital Regulated Instrument AC System – Category A, 3<sup>rd</sup> Quarter 2008

Drawings and Wiring Diagrams

25203-14064, Millstone Unit 2 Door Schedule, Rev. 21  
 25203-24091, Sheet E0101 Fire, Air & Water Seal Electrical Penetration Silicone Foam Floor/Wall, Rev. 2  
 25203-24091, Sheet C0304 Fire, Air & Water Seal Conduit Caulk Floor/Wall, Rev. 1  
 25203-24091, Sheet C0102 Fire, Air & Water Seal Conduit Silicone Foam Floor/Wall, Rev.2  
 25203-24092-T8W03, Penetration Seal Survey Map and Inspection Record, Rev. 2  
 25203-24092-T8F05, Penetration Seal Survey Map and Inspection Record, Rev. 1  
 25203-24092, A24W33A Penetration Seal Survey Map and Inspection Record, Rev. 2  
 25203-24092, A28F2 Penetration Seal Survey Map and Inspection Record, Rev. 1  
 25203-24092, A21W1 Penetration Seal Survey Map and Inspection Record, Rev. 2  
 25203-24100, Turb. & Aux Bldg. El. 25'-6" & Turb. Bldg. El. 45'-0" Map of Maps, Rev. 3  
 25203-24108, Warehouse, Aux Bldg. & Containment Encl. Bldg. El 14'-6" Map of Maps, Rev. 4  
 25203-24110, Warehouse, Aux Bldg. & Containment Encl. Bldg. El 38'-6" Map of Maps, Rev. 3  
 25203-28500 Sh. 595, FT5277A Aux. Fd. Out to Gen. 1 Loop Diagram, Rev. 7  
 25203-29554, Fire Protection Appendix R Auto Deluge System for Turbine Building Vertical Cable Shafts Area Plan and Section, Rev. 2  
 25203-30001, Main Single Line Diagram, Rev. 26  
 25203-30005, Single Line Meter & Relay Diagram 4.16kV Emerg. Buses 24C, 24D, Rev. 16  
 25203-32009 Sh. 39, Letdown heat exchanger isolation valves LTDN CTMT ISO (2-CH-089) & RBCCW outlet (RB402), Rev. 11  
 25203-32009, Sh. 40, Charging Pump P18A, Rev. 18  
 25203-32009, Sh. 41, Charging Pump Control MP18B, Rev. 21  
 25203-32009, Sh. 42, Charging Pump Pwr. Supply Crossover P18B, Rev. 13  
 25203-32009, Sh. 42A, Charging Pump Control MP18B, Rev. 2  
 25203-32009, Sh. 43, Charging Pump MP18C, Rev. 16  
 25203-32009, Sh. 43A, Charging Pump P18C, Rev. 5  
 25203-32012, Sh. 11, Auxiliary Feedwater Pump MP9A, Rev. 11  
 25203-32012, Sh. 12, Auxiliary Feedwater Pump MP9B, Rev. 10  
 25203-32020, Steam Gen. Aux. Feed Pump Turbine H21 MOV SV4188 (2-MS-464) Schematic, Rev. 8  
 25203-34004, Raceway Plan Turbine Area 2 El.14'-6", Rev. 32  
 25203-34008, Raceway Plan Turbine Area 2 El. 31'-6", Rev. 16  
 25203-34011, Raceway Plan Turbine Area El. 45'-0", Rev. 10  
 25203-34013, Raceway Plan Turbine Area – 2 El. 54' – 6", Rev. 8  
 25203-34013, Raceway Plan Turbine Area-2 El. 54'-6", Rev. 8  
 25203-34018, Raceway Plan Turbine Area El. 25'-6" & 36'-6", Rev. 17  
 25203-34021, Raceway Plan Aux. Bldg. Area 6 & 7 El. (-)45'-6", Rev. 10  
 25203-34022, Sh. 1, Raceway Plan Aux. Bldg. Area 6 El. (-25)-6", Rev. 15  
 25203-34024, Raceway Plan Aux. Bldg. Area 6 El. (-)5'-0", Rev. 10  
 25203-34025, Raceway Plan Aux. Bldg. Area 7 El.(-)5'-0", Rev. 12  
 25203-34026, Raceway Plan Aux. Bldg. Area 6 El.14'-6", Rev. 17  
 25203-34030, Raceway Plan West Elect. Pent. Rm. El. +14'-6", Rev. 15  
 25203-34031, Raceway Plan Cable Vault Area-6, El. 25'-6", Rev. 13  
 25203-34032, Sh. 1, Raceway Plan Cable Vault Area-7, El. 25'-6" FAC 1, Rev. 18  
 25203-34032, Sh. 2, Raceway Plan Cable Vault Area-7, El. 25'-6" FAC 2, Rev. 11

25203-34033, Raceway Plans & Sections Cable Vault Penetration Area El. 25'-6", Rev. 12  
25203-34077, Sh. 1, Appendix 'R' Electrical Tray and Conduit Plan Aux. Bldg. El. (-)45'-06",  
Rev. 3  
25203-34077, Sh. 2, Appendix 'R' Electrical Tray and Conduit Plan Aux. Bldg. El. (-) 25'-6",  
Rev. 4  
25203-34077, Sh. 4, Appendix 'R' Electrical Tray and Conduit Plan Aux. Bldg. El. (-)5'-0", Rev. 3  
25203-34077, Sh. 5, Appendix 'R' Electrical Tray and Conduit Plan Aux. Bldg. El. (-)5'-0", Rev. 2  
25203-34077, Sh. 6, Appendix 'R' Electrical Tray and Conduit Plan Aux. Bldg. El. (+)14'-06",  
Rev. 3  
25203-34077, Sh. 7, Appendix 'R' Electrical Tray and Conduit Plan Aux. Bldg. El. (+)14'-6",  
Rev. 7  
25203-34077, Sh. 10, Appendix 'R' Electrical Tray and Conduit Plan West Elect. Pent. Rm. El.  
(+)14'-06", Rev. 3  
25203-34077, Sh. 12, Appendix 'R' Electrical Tray and Conduit Plan Turbine Area El. (+)25'-06" &  
36'-6", Rev. 4  
25203-34077, Sh. 13, Appendix 'R' Electrical Tray and Conduit Plan Cable Vault El. (+)25'-06",  
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25203-34077, Sh. 14, Appendix 'R' Electrical Tray and Conduit Plan Cable Vault El. (+)25'-06",  
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25203-34077, Sh. 15, Appendix 'R' Electrical Tray and Conduit Plan Cable Vault Penetration  
Area El. (+)25'-06", Rev. 5  
25203-34077, Sh. 16, Appendix 'R' Electrical Tray and Conduit Plan Turbine Bldg. El. (+)14'-06",  
Rev. 5  
25203-34077, Sh. 20, Appendix 'R' Electrical Tray and Conduit Plan Turbine Bldg. El. 31'-6",  
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25203-34077, Sh. 25, Appendix 'R' Electrical Tray and Conduit Plan Turbine Bldg. El. (+)54'-06",  
Rev. 4  
25203-34077, Sh. 31, Appendix 'R' Electrical Tray and Conduit Plan Aux. Bldg El. (+)36'-06" and  
38'-6", Rev. 3  
25203-34077, Appendix 'R' Electrical Tray and Conduit Plan Turbine Bldg. El. (+)45'-0", Rev. 4

#### Piping and Instrumentation Diagrams

25203-26002, Sh. 1, Main Steam from Generators, Rev. 68  
25203-26005, Sh. 2, Feed System, Rev. 56  
25203-26008, Sh. 2, Service Water, Rev. 89  
25203-26014, Sheets 1 & 2, Reactor Coolant System, Rev. 35  
25203-26017 Sh. 1, Charging System, Rev. 55  
25203-26020, Sh. 5, Clean Liquid Radwaste System, Rev. 15  
25203-26024, Sh. 1, Containment Building Drains, Rev. 19

#### Vendor Manuals

25203-060-001A, Autopuls Alarm Suppression Control System Volume 1, Rev. C  
MS2 Vendor Inspection Report for UPS System, Dated 7/16/08

Pre-Fire Plans

A-21, Auxiliary Building Elevation 14'-6" - West DC SWGR Room (Bravo), Updated 4/30/05  
A-24, Auxiliary Building Elevation 25'-6" - Cable Vault, Updated 5/02  
A-28, Auxiliary Building Elevation 36'-6" - East 480V Load Center Room, Updated 4/01/01  
T-8, Turbine Building Elevation 45'-6" - West 45' Cable Vault (Z2 Train), Updated 8/03

Fire Drills and Critique

Fire Drill Records, Performed 2nd Quarter 2008 & 3rd Quarter 2008

Hot Work and Ignition Source Permits

27466-08-IS	27467-08-IS	27460-08-IS	27449-08-IS
27027-08-IS	26503-06-FP	26553-06-FP	25229-05-FP
24206-02-FP			

Operator Training Documents

JPM-092, Transfer Controls from the Control Room to C-10, Rev. 5  
JPM-206, Shutdown from Outside the Control Room, Rev. 1  
JPM-207, Local Manual Operation of the 'A' Atmospheric Dump Valve, Rev. 0  
JPM-217, Manual Operation of RBCCW SDC HX Outlet Valves, Rev. 1  
A79-01-C, Licensed operator training plan, Appendix R, Rev. 1

Miscellaneous Documents

Millstone Unit 2 Individual Plant Examination for External Events, Dated 12/95  
Fire Brigade Student Qualification Matrix, Dated 11/6/08  
Fire Brigade Training Record, Dated 11/20/08  
Fire Brigade Training Record, Dated 11/26/08  
Fire System Impairment Log, Dated 11/5/08  
Fire Watch Records, Dated 11/5/08 - 11/11/08  
Millstone Common Maintenance Rule (a)(1) Evaluation for the Emergency Lighting System (Tracking CR-05-13649), Rev. 2  
Millstone Common Maintenance Rule (a)(1) Evaluation for the Emergency Lighting System (Tracking CR-05-13649), Rev. 0  
Millstone Common Maintenance Rule (a)(1) Evaluation for the Emergency Lighting System (Tracking CR M3-97-1984), Rev. 11  
Emergency Lighting System Failure Tracking Table, Dated 11/19/08  
Impell Report 05-0240-005, Fire Code Compliance Review, Rev. 0, Dated 9/86  
Project P-1117-025, NFPA Code Compliance Deviation Closeout Review, Dated 1/98  
Upfront FSAR change request (FSARCR) 99-MP2-9. 1/8/98  
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Purchase Order for Communications UPS System. Rev. 1  
Cable Raceway Data for P18BM, P18CM, P9BM, 2-CH-089, FI-5277A-1

25203-SP-M2-SU-1046, Appendix R Communications, Rev. 0  
 SP-EE-0362, Millstone Unit 2 Station Blackout Safe Shutdown Scenario Document, Rev 2  
 M2-EV-98-0121, Technical Evaluation for Communications for MP2 SBO Event, Rev 0.  
 M2-98045, Engineering Work Assignment, Reroute Appendix R Communication Cables, Rev. 0  
 AOP 2579A Rev. 7 Final V&V Documentation Package, Dated 3/16/99  
 AOP 2579B Rev. 4 Final V&V Documentation Package, Dated 3/17/99  
 AOP 2579D Rev. 4 Final V&V Documentation Package, Dated 3/17/99  
 AOP 2579F Rev. 4 Final V&V Documentation Package, Dated 3/11/99

### Condition Reports

98017796	06-10279	07-10182	08-08245
99003026	06-12110	08-01508	08-09189
05-11717	06-12112	08-02636	CR119667
06-00221	07-00647	08-02792	CR120919
06-00410	07-00786	08-03681	CR121184
06-00423	07-01345	08-03766	CR121147
06-00917	07-08146	08-04164	CR119114
06-04907	07-08825	08-05005	CR119320
06-05150	07-08927	08-05873	CR119667
06-07169	07-10124	08-06846	CR121147
06-08497	07-10156	08-07160	
06-09983	07-10158	08-07276	

### Work Orders

M2 99 00732	M2 02 13748	M2 04 08102	M2 08 07373
M2 99 02341	M2 03 05780	M2 08 01451	
M2 02 07847	M2 04 08100	M2 08 03849	

## **LIST OF ACRONYMS**

AC	Alternating Current
ADAMS	Agency Documents Access and Management System
AFW	Auxiliary Feedwater
CFR	Code of Federal Regulation
CR	Condition Report
DG	Diesel Generator
Dominion	Dominion Nuclear Connecticut, Inc.
DRS	Division of Reactor Safety
DRP	Division of Reactor Projects
FHA	Fire Hazards Analysis
FPP	Fire Protection Program
FSAR	Final Safety Analysis Report
IMC	Inspection Manual Chapter
IP	Inspection Procedure

IR	Inspection Report
kV	Kilo-Volt
MDAFW	Motor Driven Auxiliary Feedwater
NCV	Non-cited Violation
NFPA	National Fire Protection Association
NRC	Nuclear Regulatory commission
SDP	Significance Determination Process
SER	Safety Evaluation Report
SG	Steam Generator
TDAFW	Turbine Driven Auxiliary Feedwater
V	Volt