

# Millstone 2

## 2Q/2011 Plant Inspection Findings

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### Initiating Events

**Significance:** **G** Jun 30, 2011

Identified By: Self-Revealing

Item Type: FIN Finding

**(FIN 05000336/2011003-04 Failure to Follow Procedure for Starting a Second SGFP Results in Reactor Trip)**

•Green. A self-revealing Green finding (FIN) was identified for Dominion's failure to follow procedure OP 2204, "Load Changes" when starting the second steam generator feedwater pump (SGFP). Specifically, the operating crew did not maintain SGFP suction pressure greater than 325 psig which led to a feed pump trip and subsequent reactor trip on low steam generator level. Dominion entered the issue into their corrective action program (CAP), revised procedure OP 2204, and conducted training exercises emphasizing safe operating envelopes, critical parameters to monitor, and actions to take to restore margin if plant conditions degrade.

The finding is more than minor because it is similar to NRC Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues, Example 4b" in that a failure to follow procedures, led to a reactor trip. It is associated with the Human Performance attribute of the Initiating Events cornerstone and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The finding was of very low safety significance (Green) because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. The inspectors determined that this finding had a cross-cutting aspect in Human Performance, Work Practices component, because Dominion personnel did not follow the load changes procedure. [H.4(b)] (Section 4OA3)

Inspection Report# : [2011003](#) (*pdf*)

**Significance:** **W** Apr 29, 2011

Identified By: Self-Revealing

Item Type: VIO Violation

**VIO 05000336/2011008-01, Multiple Examples of Procedural Violations and Inadequate Procedures Relating to Control Room Crew Performance During a Plant Transient.**

White: A self-revealing violation (VIO) of low to moderate safety significance (White) was identified involving the failure of Millstone personnel to carry out their assigned roles and responsibilities and inadequate reactivity management during main turbine control valve testing on February 12, 2011, which contributed to the unanticipated reactor power increase. Specifically, the Millstone Unit 2 operations crew failed to implement written procedures that delineated appropriate authorities and responsibilities for safe operation and shutdown and a procedure for controlling reactor reactivity. In addition, the licensee failed to establish written procedures for the Reactor Protection System (RPS) Variable High-Power Trip (VHT), and for power operation and transients involving multiple reactivity additions.

The finding is associated with two violations of NRC requirements specified by Technical Specifications. There were no immediate safety concerns following the transient because the event itself did not result in power exceeding license limits or fuel damage. Additionally, interim corrective actions were taken, which included removing the Millstone Unit 2 control room crew involved in the transient from operational duties pending remediation, and establishment of continuous management presence in the Millstone Unit 2 control room while long term corrective actions were developed. Dominion entered this issue, including the evaluation of extent-of-condition, into the corrective action program (CR413602) and performed a root cause evaluation (RCE).

The finding is more than minor because the performance deficiency (PD) was associated with the Human Performance attribute of the Initiating Events cornerstone and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during power operations.

Additionally, the PD could be viewed as a precursor to a significant event. Because the finding primarily involved human performance errors, probabilistic risk assessment tools were not well suited for evaluating its significance. The team determined that the criteria for using IMC 0609, Appendix M, "Significance Determination Process Using Qualitative Criteria," were met, and the finding was evaluated using this guidance, as described in Attachment 4 to this report. Based on the qualitative review of this finding, regional management concluded the finding was of low to moderate safety significance (White).

The team concluded that this finding had a cross-cutting aspect in the Human Performance area, Decision Making component, because Dominion licensed personnel did not make the appropriate safety-significant decisions, especially when faced with uncertain or unexpected plant conditions to ensure safety was maintained. This includes formally defining the authority and roles for decisions affecting nuclear safety, communicating these roles to applicable personnel, and implementing these roles and authorities as designed [H.1(a)]. (Section 2.1)

Inspection Report# : [2011008](#) (pdf)

**Significance:**  Apr 29, 2011

Identified By: Self-Revealing

Item Type: FIN Finding

**FIN 05000336/2011008-02, Improper Operation of Turbine Control Valves During Testing.**

Green: The team identified a self-revealing finding of very low safety significance (Green) for improper operation of the turbine controls during turbine control valve testing. Specifically, the inspectors identified that control room operators failed to correctly implement surveillance procedure SP-2651N, "Main Control Valve Testing." Incorrect operation of the turbine controls caused an unplanned power increase from 88 percent to 96 percent. Dominion entered this issue into the corrective action program (CR415094).

The team determined that this finding was more than minor because it was similar to NRC Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," Example 4b, in that the incorrect operation of the turbine load selector pushbutton caused a plant transient. The finding was associated with the human performance attribute of the Initiating Events cornerstone and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. The team concluded that the finding was of very low safety significance (Green) because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. Enforcement action does not apply because the performance deficiency did not involve a violation of a regulatory requirement. The team also determined that the finding had a cross-cutting aspect in the Human Performance area, Resources component, because Dominion did not provide adequate training of personnel and sufficient qualified personnel [H.2(b)]. (Section 2.2)

Inspection Report# : [2011008](#) (pdf)

**Significance:**  Dec 31, 2010

Identified By: Self-Revealing

Item Type: FIN Finding

**(FIN 05000336/2010005-01, Failure to Provide an Adequate Procedure for Backwashing Condenser Water Boxes Results in Reactor Trip).**

Green. A self-revealing finding of very low significance was identified for Dominion's failure to provide an adequate procedure for backwashing the Unit 2 condenser water boxes in accordance with procedure MP-05-MMM, "Manuals, Procedures, Guidelines, Handbooks and Forms". Specifically, in implementing the procedure, the 'A' circulating water (CW) pump automatically ramped down to zero speed shortly after securing the 'B' CW pump. This resulted in a loss of condenser vacuum, which caused an automatic turbine trip. The turbine trip caused an automatic reactor trip. Dominion entered the issue into their corrective action program and revised the backwashing procedure, OP 2325D.

The inspectors determined that Dominion's failure to provide an adequate procedure for backwashing the Unit 2 water boxes in accordance with procedure MP-05-MMM, "Manuals, Procedures, Guidelines, Handbooks, and Forms" was a performance deficiency. The finding is more than minor because it was similar to NRC Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," Example 4b, in that an inadequate procedure led to a reactor trip. The finding was associated with the procedure quality attribute of the Initiating Events cornerstone and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety

functions during power operations. Specifically, Dominion's failure to provide an adequate procedure for backwashing Unit 2 condenser water boxes resulted in the variable frequency drive (VFD) logic securing only the CW pump running in that condenser and subsequently caused a reactor trip. The finding was of very low safety significance (Green) because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. The inspectors determined that this finding had a cross-cutting aspect in the Human Performance area, Resources component, and because Dominion did not provide an accurate and up-to-date procedure for the backwashing of the Unit 2 water boxes. [H.2(c)] (Section 4OA3)

Inspection Report# : [2010005](#) (pdf)

**Significance:**  Sep 30, 2010

Identified By: Self-Revealing

Item Type: FIN Finding

**FIN 05000336/2010004-01, Failure to Implement Timely Corrective Action for a Degraded FRV Results in Manual Reactor Trip**

Green. A self-revealing finding (FIN) of very low safety significance was identified for Dominion's failure to implement timely corrective action for a degraded #2 feedwater regulating valve (FRV) in accordance with procedure PI-AA-200, "Corrective Action." Two weeks after the issue was first identified, the #2 FRV further degraded causing Dominion to trip the reactor when the #2 Steam Generator (SG) level could not be controlled. Dominion entered this issue into their corrective action program (CR382055).

This finding is more than minor because it was similar to NRC Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," Example 4f, in that the failure to correct a condition adverse to quality led to a reactor trip. The finding was associated with the Equipment Performance attribute of the Initiating Events cornerstone and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions. The finding was of very low safety significance (Green) because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. The inspectors determined that this finding had a cross cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because Dominion did not take appropriate corrective action to address the degraded #2 FRV in a timely manner, commensurate with its safety significance.[P.1(d)] (Section 4OA3).

Inspection Report# : [2010004](#) (pdf)

**Significance:**  Sep 30, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

**NCV 055000336/2010004-01, Failure to Promptly Identify and Correct the Source of a Unit 2 RCS Pressure Boundary Leak).**

Green. The inspector identified a Green, NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," for Dominion's failure to promptly identify and correct the source of a reactor coolant system (RCS) pressure boundary leak from July 3, 2009, through July 13, 2009. Dominion subsequently repaired the leak and returned to 100 percent power.

The inspectors determined that Dominion's failure to promptly identify and correct the cause of pressure boundary leakage is a performance deficiency that was reasonably within Dominion's ability to foresee and correct and should have been prevented. This issue is more than minor because the issue is similar to NRC Inspection Manual Chapter (IMC) 0612, Appendix E, and minor example 2.g. The inspectors determined that the issue affects the Initiating Events Cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The inspector concluded that this condition, assuming the worst case degradation, would not have affected other mitigating systems resulting in a total loss of their safety function. Accordingly, the finding was determined to be of very low safety significance (Green) using IMC 609, Attachment 0609.004, Phase 1 Screening Worksheet. The inspector determined that this issue had a cross-cutting aspect in the Problem Identification and Resolution cross-cutting area, Corrective Action Program component, because Dominion did not identify the pressure boundary leakage completely, accurately, and in a timely manner commensurate with its safety significance. [P.1(a)] (Section 4OA2)

Inspection Report# : [2010004](#) (pdf)

**Significance:** SL-IV Sep 30, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

**NCV 0500336/2010004-02, Failure to Perform an ASME Code-compliant Radiographic Examination on a Class 1 Weld on the Unit 2 'A' RCP Seal Cooler Piping.**

Severity Level IV. The inspector identified a Severity Level IV, NCV of 10 CFR 50.55a(2)(c)(1) and 10 CFR 50.55a(3), when Dominion did not perform an ASME Code-compliant radiographic examination for a leak in a Class 1 weld on the Unit 2 'A' RCP seal cooler piping before returning the system to service. Dominion was out of compliance with 10 CFR 50.55a(2)(c)(1), 10 CFR 50.55a(3), and Section III of the American Society of Mechanical Engineers (ASME) Code between July 24, 2009, and November 10, 2009. The NRC granted verbal relief from the 10 CFR 50.55a(2)(c)(1), 10 CFR 50.55a(3), and the ASME Code requirements on November 10, 2009. Subsequently, the relief request was approved, in writing, by the NRC on April 26, 2010.

In accordance with IMC 0612, Appendix B, Section 1-2, this finding had the potential to impact the NRC's ability to perform its regulatory function because Dominion verbally informed the NRC on July 17, 2009, that they would repair the affected component in accordance with ASME Code requirements. However, due to Dominion's misinterpretation of the ASME Code, Dominion did not subsequently inform the NRC of its inability to meet Code requirements (i.e. perform a Code compliant radiographic examination of the affected weld) before returning the plant to service. As a result, Dominion's actions had impeded the NRC's ability to evaluate and determine the efficacy of the licensee's actions. The issue was characterized as Severity Level IV because it is similar to the example provided in the NRC Enforcement Policy Section 6.1.d.2, in that, it involved a violation of NRC requirements that resulted in a condition evaluated as having very low safety significance (i.e., Green) by the Significance Determination Process (SDP). The inspector determined that this issue had a cross-cutting aspect in the Human Performance cross-cutting area, Decision Making component, because Dominion did not use conservative assumptions in their decision making when they concluded that Code relief from the NRC would not be necessary to accomplish the repair. [H.1(b)]. (Section 4OA2)

Inspection Report# : [2010004](#) (pdf)

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## Mitigating Systems

**Significance:**  Jun 30, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**(NCV 0500336/2011003-02 Untimely Corrective Action for Safety Related Inverters Leads to Repetitive Out of Calibration Results)**

Green. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action in that Dominion did not take timely corrective action to address repetitive out of calibration conditions associated with safety related inverters. Specifically, Dominion continued to have out of calibrations conditions associated with the four safety-related inverters for the 120VAC vital instrument panels in April 2011, and had not taken corrective actions since March 2009, when Dominion received a NCV for the same issue. Dominion entered the issue into their CAP and adjusted the out of calibration parameters. The finding is similar to example 4.f in NRC Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," in that the failure to correct the out of calibration conditions affected operability of the inverters. The finding is more than minor because it is associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding was of very low safety significance (Green) because it was not a design or qualification deficiency, did not represent a loss of system safety function, did not represent an actual loss of safety function of a single train, did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors determined that this finding had a cross-cutting aspect in Problem Identification and Resolution, CAP component, because Dominion did not take appropriate corrective action in a timely manner to address the repetitive

out of calibration conditions with the safety related inverters.[P.1(d)](Section 71111.22)

Inspection Report# : [2011003](#) (pdf)

**Significance:**  Sep 22, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

**NCV 05000336/2010008-01; 05000423/2010008-01, Failure to Properly Control Fire Fighting Strategies.**

Green. The team identified a non-cited violation of Millstone Unit 2 Operating License Condition 2.C.(3), and Unit 3 Operating License Condition 2.H, for the failure to implement all provisions of the approved Fire Protection Programs. Specifically, Dominion did not implement adequate review, approval and distribution of fire fighting strategies to provide for the adequate development and maintenance of effective strategies. As a result, the team found that Dominion did not provide adequate guidance in the fire fighting strategies for several areas that included the Unit 2 "8" emergency diesel generator (EDG) room, and the Unit 3 west switchgear room. This issue was entered into Dominion's corrective action program as condition report (CR) 388786.

The team determined that the failure to administratively control fire fighting strategies as required by the fire protection program was a performance deficiency. This finding was more than minor because it adversely affected the availability and capability objectives of the protection against external events (i.e., fire) attribute under the Mitigating Systems Cornerstone. Specifically, the above examples would likely cause delays in manual fire fighting activities and, therefore, adversely affected the defense-in-depth aspect of the fire protection program to limit fire damage by quick suppression of those fires that occur. The team performed a Phase 1 SDP screening, in accordance with NRC IMC 0609, Appendix F, "Fire Protection Significance Determination Process." This finding affected fire prevention and administrative controls, and was screened to very low safety significance (Green) because this failure to control fire fighting strategies was determined to represent a low degradation rating. This finding had a cross-cutting aspect in the area of human performance because Dominion failed to ensure complete and accurate fire fighting strategies were available to the fire brigade to support timely extinguishment of fires. [H.2(c)] (Section 1 R05.03)

Inspection Report# : [2010008](#) (pdf)

**Significance:**  Sep 22, 2010

Identified By: NRC

Item Type: VIO Violation

**VIO 05000336/2010008-02, Failure to Protect Safe Shutdown Equipment From the Effects of Fire .**

Green. The team identified a cited violation of 10 CFR Part 50, Appendix R, Section III.G.2 for the failure to protect required post-fire safe shutdown components and cabling to ensure one of the redundant trains of equipment remains free from fire damage. In lieu of providing the required separation, Dominion utilized unapproved operator manual actions to mitigate component malfunctions or spurious operations caused by a single fire induced circuit fault (hot short, open circuit or short to ground). Dominion has entered this issue into the corrective program for resolution. The team found the manual actions to be reasonable interim compensatory measures pending final resolution by Dominion.

Dominion's failure to protect components credited for post-fire safe shutdown from fire damage caused by single spurious actuation is considered a performance deficiency. The performance deficiency was more than minor because it affected the Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to an external event to prevent undesirable consequences in the event of a fire. Specifically, the use of operator manual actions during post-fire shutdown is not as reliable as normal systems operation which could be utilized had the separation requirements of 10 CFR 50, Appendix R, Section III.G.2 been met and therefore prevented fire damage to credited components and/or cables. The team used

IMC 0609, Appendix F, "Rre Protection Significance Determination Process (SDP)," Phase 1 and an SRA conducted Phase 3 evaluation, to determine that this finding was of very low safety significance (Green). The team determined the finding had a low degradation rating because the manual actions were reviewed by the team and were found to be acceptable interim compensatory measures (pending licensee actions to resolve the non-compliances or obtain exemptions) because they did not require complicated actions, adequate time was available to accomplish the actions and the actions were properly included in the appropriate abnormal operating procedures. This finding had a cross cutting aspect in the area of problem identification and resolution associated with the corrective action program because Dominion did not completely and accurately identify deficiencies related to single spurious actuations of credited post-fire safe shutdown components. [P.1.(a)] (Section 1 R05.06)  
Inspection Report# : [2010008](#) (*pdf*)

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## Barrier Integrity

**Significance:**  Jun 30, 2011

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

**(NCV 0500336/2011003-03 Inadequate Corrective Action Results in Loss of Enclosure Building's Safety Function.)**

Green. A self-revealing NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action" was identified in that Dominion did not take adequate corrective action to address the cause of main steam safety valve (MSSV) exhaust pipe bushings not seating which resulted in a loss of the Enclosure Building's safety function to control the release of radioactive material. Dominion entered the issue into their CAP, cleaned and lubricated the MSSV exhaust pipes, implemented a modification to upgrade the MSSV outlet boots and qualify them as part of the Enclosure Building filtration boundary, and successfully performed the Enclosure Building Filtration System (EBFS) negative pressure test.

The finding is more than minor because it is associated with the Procedure Quality attribute of the Barrier Integrity cornerstone and affected the cornerstone objective to provide reasonable assurance that physical design barriers (containment) protect the public from radionuclide releases caused by accidents or events. The finding was of very low safety significance (Green) because it only represents a degradation of the radiological barrier function provided for the auxiliary building. The inspectors determined that this finding had a cross-cutting aspect in Problem Identification and Resolution, CAP component, because Dominion did not take appropriate corrective action to address the Enclosure Building surveillance test failure in 2009.[P.1(d)](Section 4OA3)

Inspection Report# : [2011003](#) (*pdf*)

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## Emergency Preparedness

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## Occupational Radiation Safety

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## Public Radiation Safety

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## Physical Protection

Although the NRC is actively overseeing the Security cornerstone, the Commission has decided that certain findings pertaining to security cornerstone will not be publicly available to ensure that potentially useful information is not provided to a possible adversary. Therefore, the [cover letters](#) to security inspection reports may be viewed.

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## Miscellaneous

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