

Millstone 2

4Q/2008 Plant Inspection Findings

Initiating Events

Significance:  Sep 30, 2008

Identified By: Self-Revealing

Item Type: FIN Finding

(FIN 05000336/2008004-01, Installation of Incorrect Internal Trim Package in Valve 2-HD-103A Results in Reactor Trip)

A self-revealing finding of very low safety significance (Green) was identified for Dominion's failure to ensure the proper internal trim package (cage) was installed in valve 2-HD-103A, the 1A feedwater heater level control valve as required by Millstone Procedure MP-16-MMM, "Organizational Effectiveness (Corrective Action Program, Operating Experience Program, Independent Safety Engineering Function)". This resulted in level oscillations in feedwater heater 2A during Unit 2 turbine control valve testing and a loss of feedwater, requiring the operators to manually trip the plant. Dominion's corrective actions included installing the correct cage in the valve and entering the issue into their corrective action program.

This finding was more than minor because it is associated with the human performance attribute of the initiating event 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 finding was determined to be of very low 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. This finding has a cross cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because Dominion did not identify the issue of the incorrect part for 2-HD-103A completely, accurately, and in a timely manner. [P.1(a)] (Section 40A3)

Inspection Report# : [2008004](#) (*pdf*)

Significance:  Sep 30, 2008

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

(NCV 05000336/2008004-02 Failure to Correct Safety Valve Lifting Following Uncomplicated Reactor Trips).

A self-revealing non-cited violation (NCV) of 10 CFR 50 Appendix B, Criterion XVI, Corrective Action, was identified for failure to take effective corrective actions to prevent a Millstone Unit 2 (MP2) steam generator safety valve from lifting following uncomplicated reactor trips from 100% power. Following reactor trips on May 22, 2008 and June 28, 2008, a steam generator safety valve lifted due to a delayed quick open signal to the condenser steam dumps and atmospheric dump valves. In July 2008, Dominion had taken corrective actions by changing the power supplies of the quick open signal controller inputs to ensure an immediate quick open signal to both the condenser steam dump valves and the atmospheric dump valves. Dominion has entered this issue into their corrective action program.

The issue was more than minor because it affects the equipment performance attribute of the Initiating Events Cornerstone and the objective to limit the likelihood of those events that upset plant stability. The cycling of the steam generator safety valves results in a greater likelihood that the valves will not reseal properly during an event. The finding was determined to have very low safety significance since it did not contribute to the likelihood of a primary loss of coolant accident, did not contribute to the likelihood of a reactor trip and the unavailability of mitigating equipment, and did not increase the likelihood of a fire or internal/external flood. This finding is related to the cross-cutting area of Problem Identification and Resolution, Corrective Action Program [P.1(d)]. (Section 40A3)

Inspection Report# : [2008004](#) (*pdf*)

G**Significance:** Jun 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Maintenance Instructions Causes Reactor Coolant System Unidentified Leakage in Excess of Technical Specification Limits

The inspectors identified a Green non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings" for Dominion's failure to provide adequate maintenance instructions in the authorized work order (AWO) for replacing the gaskets on the Unit 2 B LPSI pump suction line. Specifically, the AWO did not have torquing requirements for the flanged connection. As a result, the flanged joint was overtightened, causing the flexitallic gasket to fail. Spiral winding debris from the gasket became lodged in 2-SI-432, the B LPSI pump suction isolation valve, preventing the valve from closing and causing an unidentified reactor coolant system (RCS) leak in excess of technical specification (TS) limits. Dominion took immediate action to locate and remove the spiral winding material from plant systems, took prompt action to repair valve 2-SI-432, and entered this issue into their corrective action system.

This finding was more than minor because it is associated with the human performance attribute of the initiating event cornerstone and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The finding has a cross cutting aspect in the area of Human Performance, Resources, because Dominion did not ensure complete, accurate, and up-to-date work packages for the replacement of the gaskets in the B LPSI pump suction line. [H.2(c)]. (Section 40A3)

Inspection Report# : [2008003](#) (*pdf*)

Mitigating Systems

G**Significance:** Dec 05, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

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

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)

Inspection Report# : [2008008](#) (*pdf*)

G**Significance:** Dec 05, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

NCV 05000336/2008008-02, Failure to Ensure Timely Manual Action Consistent with the Post-Fire Safe Shutdown Analysis.

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)

Inspection Report# : [2008008](#) (*pdf*)**G****Significance:** Aug 29, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

B.5.b Phase 2 and 3 Mitigating Strategy

This finding, affecting the Barrier Integrity Cornerstone, is related to mitigative measures developed to cope with losses of large areas of the plant; in response to Section B.5.b. of the February 25, 2002, Interim Compensatory Measures (ICM) Order (EA-02-026) and related NRC guidance. This finding has been designated as "Official Use Only - Security-Related Information;" therefore, the details of this finding are being withheld from public disclosure. This finding has a cross-cutting aspect in the area of Human Performance (Resources). [H.2(c)]. See inspection report for more details.

Inspection Report# : [2008007](#) (*pdf*)**G****Significance:** Mar 31, 2008

Identified By: NRC

Item Type: FIN Finding

Failure to Evaluate a Unit 2 Charging System Non conforming Condition against the Current Licensing Bases

The inspectors identified a finding for Dominion's failure to evaluate a non-conforming plant condition against the current licensing basis (CLB) as required by Dominion procedure OP-AA-102-1101, Revision 0, "Development of Technical Basis to Support Operability Determinations." Specifically, Dominion, in multiple instances, failed to evaluate the impact that a potential common mode charging system failure would have on the Updated Final Safety Analysis Report Chapter 14.6.1, "Inadvertent Opening of Power Operated Relief Valves (PORVs)," event, the analysis of record for which credited both charging and safety injection availability. Corrective actions for this issue included the initiation of an operations standing order and crew briefings to ensure all crews understood the CLB related to Unit 2 charging and the need to implement the compensatory action for this chapter 14.6.1 event, and a subsequent operability determination (OD) revision to ensure charging was properly evaluated and documented within the OD.

This finding is more than minor because, if left uncorrected, the issue would become a more significant safety

concern. Specifically, degraded and non-conforming plant conditions must be evaluated against their credited functions in the CLB to ensure the adverse condition is properly evaluated for operability. This finding was determined to be of very low safety significance (Green) because it did not result in a loss of charging system operability or functionality. This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program component, because Dominion did not thoroughly evaluate a Unit 2 charging system non-conforming condition against the CLB [P.1(c)].

Inspection Report# : [2008002](#) (*pdf*)

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Significance: Mar 31, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Identify Unacceptable Unit 2 Charging Pump Surveillance Test Data

The inspectors identified a non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion XI, "Test Control," for Dominion's failure to adequately evaluate surveillance test results to ensure test acceptance criteria had been met on June 20, 2007. Specifically, the inspectors identified that the "A" charging pump pulsation dampener surveillance test had incorrect data (i.e., testing duration time) and had been accepted as satisfactorily complete, although the test data was outside the surveillance acceptance criteria. The test, in part, demonstrated that nitrogen gas from a failed charging pump discharge dampener would not migrate into the common suction line prior to the credited operator action to shut the pump's suction valve. A subsequent review determined the surveillance test data was incorrect and the "A" charging pump was operable. Dominion's corrective actions for this issue included briefings to provide additional coaching and heighten awareness to the Unit 2 operations shift crews, a review of actual surveillance computer data and review of subsequent surveillances to ensure system operability, and the creation of a trend condition report including other related human performance errors (CR-08-03220).

This finding was more than minor because it was associated with the human performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective of ensuring the availability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the failure to identify out of specification data could result in the failure to identify inoperable equipment. The inspectors also concluded that if the failure to properly evaluate charging pump discharge dampener test data was not corrected, a more significant concern could exist (i.e. common mode failure of charging). The finding was determined to be of very low significance (Green), because it was a deficiency confirmed not to result in loss of safety function. The performance deficiency had a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program component, because Dominion did not identify out of specification test data [P.1(a)].

Inspection Report# : [2008002](#) (*pdf*)

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Significance: Mar 31, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Identify a Service Water Bypass Flow Path following a Failed IST

The inspectors identified a non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for Dominion's failure to identify a condition adverse to quality after the "B" service water (SW) pump failed a Technical Specification in-service test (IST). Specifically, on March 9, 2008, Dominion declared the "B" Service Water (SW) pump operable, despite a failed IST flow surveillance. Dominion based this declaration on the incorrect assumption that the failed pump differential pressure (dp) was indicative of faulty test equipment vice an actual equipment issue. On March 10, 2008, Dominion determined that the unacceptable "B" SW dp was caused by back pressure from the running "C" SW pump through the shut "B" swing pump cross connect valve (2-SW-79B). The inspectors identified that Dominion did not have a reasonable basis to consider the IST invalid based on the information available at the time. Corrective actions for this issue included implementing an alternate plant configuration to ensure train separation, performing an assessment to evaluate past operability and to establish a bounding service water temperature at which the "B" service water pump would be considered inoperable, and incorporating the 2-SW-97B leakage repair in the 2R18 refueling outage.

This finding was more than minor because it was associated with the equipment performance attribute of the Mitigating System cornerstone, and affected the cornerstone's objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, Dominion concluded that the "B" SW pump IST containing unacceptable dp data was invalid based, in

part, on an inability to justify the results (i.e. high dp and nominal flow). Consequently, the “B” SW pump was inappropriately declared operable and the actual degraded condition was not promptly identified and corrected. This finding is of very low safety significance (Green) because it did not result in a confirmed loss of service water train operability. This finding has a cross cutting aspect in the area Human Performance, Decision Making Component, because Dominion did not use conservative assumptions in restoring “B” SW pump operability following a failed IST surveillance [H.1(b)].

Inspection Report# : [2008002](#) (pdf)

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Significance: Feb 29, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to take adequate corrective actions for a condition affecting control room operability and temperature limits post-trip

The inspectors identified a Green non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, “Corrective Action,” for Dominion’s failure to take adequate corrective actions for a condition adverse to quality involving the potential for Unit 2 control room temperature heat-up challenging equipment operability and personnel habitability thresholds following a reactor trip. Specifically, in 2007, Dominion’s associated operability review, issue prioritization, and subsequent evaluation did not adequately consider post-trip time critical operator tasks, operator training, and control room heat up rate calculations. As a result, Dominion incorrectly concluded that no further action was needed to ensure that control room temperature limits were not exceeded. Dominion’s short-term corrective actions included review of a control room heat-up calculation, providing interim direction to the operating crews concerning control room air conditioning (A/C) restoration, and updating applicable emergency operating procedures to ensure adequate control room cooling was maintained.

The finding is more than minor because it was associated with the procedural quality attribute for the Mitigating System cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems (and personnel) that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, Dominion did not ensure that control room temperature limits would not be exceeded for non-accident post-trip events involving a loss of control room A/C which could directly impact the reliability of safety-related equipment operated from the control room. This finding is of very low significance because it did not result in the loss of operability or functionality.

This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program Component, because Dominion did not properly evaluate a condition adverse to quality including properly classifying, prioritizing, and evaluating for operability (P.1.c)

Inspection Report# : [2008006](#) (pdf)

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Significance: Feb 29, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to take adequate corrective actions for a Unit 2 charging system common mode failure vulnerability

The inspectors identified a Green non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, “Corrective Action,” for Dominion’s failure to take adequate corrective actions for a condition adverse to quality involving a longstanding degraded condition impacting the Unit 2 charging pumps. Specifically, since January 2006, Dominion did not take timely and appropriate corrective actions commensurate with the potential safety significance as the condition presented a potential common cause failure of the charging pumps. Dominion’s short-term corrective actions included corrective maintenance on degraded charging pump internal check valves, a reasonable assurance of continued operability evaluation, and development of a charging pump troubleshooting plan.

The finding is more than minor because it affected the equipment performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the degraded condition resulted in unplanned unavailability of the safety-related charging pumps and represented a challenge to the reliability of the charging system due to the common mode failure vulnerability. The finding was determined to be of very low safety significance (Green) because it was a design deficiency confirmed not to result in loss of system safety function.

This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action

Program Component, because Dominion did not take appropriate corrective actions to address a safety issue and adverse trend in a timely manner, commensurate with the safety significance and complexity of the issue (P.1.d)
Inspection Report# : [2008006](#) (*pdf*)

Barrier Integrity

Significance:  Feb 29, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to take adequate corrective actions for a condition adverse to quality involving a non-conservative IST procedure

The inspectors identified a Green non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, “Corrective Action,” for Dominion’s failure, in January 2005, to take adequate corrective actions for a condition adverse to quality involving a non conservative in-service test (IST) procedure for two safety injection (SI) valves (2 SI 659/660). Specifically, Dominion did not update a supporting calculation and make the appropriate changes to the associated IST acceptance criteria for these SI valves. These valves have a design basis function to close on a safety recirculation actuation signal to prevent radioactive release to the environment through the normally vented refueling water storage tank (RWST). In February 2008, Engineering performed a prompt operability determination and determined that the valves remained operable (based on the most recent IST results, calculation review, valve design margin, trend data, and engineering judgment).

The finding is more than minor because it affected the reactor coolant system equipment and barrier performance attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective of providing reasonable assurance that physical design barriers (containment) protect the public from radionuclide releases caused by accidents or events. Specifically, Dominion’s non-conservative leakage test did not provide reasonable assurance that the SI valves would provide adequate isolation to preclude a post-accident release through the vented RWST. In addition, the finding is similar to NRC IMC 0612, Appendix E, Example 3.j, because a calculation error resulted in a condition where there was a reasonable doubt on the operability of the associated SI valves. This finding is of very low significance because it did not represent an actual open pathway in the physical integrity of reactor containment.

Inspection Report# : [2008006](#) (*pdf*)

Emergency Preparedness

Occupational Radiation Safety

Public Radiation Safety

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.

Miscellaneous

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