

Millstone 2

4Q/2015 Plant Inspection Findings

Initiating Events

Significance:  Nov 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

Procedure Failed to Direct Adequate Venting of SDC System

A self-revealing Green NCV of Millstone Power Station Unit No. 2 TS 6.8.1, "Procedures," was identified because the procedure used by Dominion to place the SDC system in service did not verify that the SDC suction line to the LPSI pumps was filled and vented prior to placing the system in service which appears to be the likely cause for opening SDC suction Relief Valve (RV) 2-SI-468. To address this issue, Dominion revised the procedure to include venting at SI-075 as part of step 4.12.2 of OP 2207. Dominion entered this issue into their corrective action program as CR1011898.

The finding was more than minor because it was associated with procedure quality attribute of the Initiating Events cornerstone and affected the cornerstone objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions during shutdown operations. Specifically, the finding identifies an increase in the likelihood of a loss of SDC resulting from the unexpected opening of RV 2-SI-468. Using a bounding and conservative quantitative detailed risk analysis, coupled with deterministic risk-informed defense-in-depth considerations, the finding was determined to be of very low risk significance.

This finding had a cross-cutting aspect in the area of Human Performance, Resources, because Dominion did not ensure procedures were adequate to support nuclear safety. Specifically, the plant cooldown procedure did not ensure that the SDC suction line to the LPSI pumps was full of water prior to placing the system in service.

Inspection Report# : [2015012](#) (*pdf*)

Significance:  Aug 01, 2014

Identified By: NRC

Item Type: FIN Finding

Inadequate Implementation of Dominion's Design Change Process

The NRC identified a finding of very low safety significance (Green), in that Dominion did not ensure correct implementation of their design change process procedure when establishing licensing basis requirements for removal of the SPS. Specifically, Dominion did not correctly evaluate the impact of removing the system on the requirements of General Design Criterion (GDC) 17 and did not address the failure mechanism of this new design in the design change documents, as required by their design change procedure. Dominion entered this issue into the corrective action program for resolution (CR 553967 and CR 551068).

The team determined that Dominion's failure to implement their design change process procedure was a performance deficiency. This performance deficiency was more than minor because it was associated with the design control attribute of the Initiating Events Cornerstone and affected the cornerstone objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions during shutdown and power operations. The team performed a risk screening in accordance with IMC 0609, Appendix A, "Significance Determination Process for Findings At-Power," using Exhibit 1, "Initiating Events Screening Questions," Section C, "Support System Initiators." The answer to the question in Section C would be NO, because the finding did not increase the likelihood of a loss of two transmission lines with one line out of service (OOS), and affect mitigation equipment. The team determined that this finding had a cross-cutting aspect in the area of Human Performance, Procedure Adherence, because the design

change process procedure was not adequately followed, in that the impact of the change on the current design basis and licensing bases was not evaluated correctly [H.8]

Inspection Report# : [2014011](#) (*pdf*)

Mitigating Systems

Significance:  Dec 31, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

Charging Packing Lubrication Pump Inadequate Operating Procedure Acceptance Criteria

The inspectors identified a Green, Non-Cited Violation (NCV) of 10 CFR 50 Appendix B Criterion V, Instructions, Procedures, and Drawings associated with Dominion's failure to include in the Unit 2 charging pump operating procedure appropriate acceptance criteria for determining operability of the Unit 2 charging pumps upon the loss of the associated charging flushing/lubrication pump. Specifically, Dominion implemented a procedure change which stated that the condition of the charging flushing/lubrication pumps does not affect charging pump operability or mission time without supporting technical information and contrary to guidance provided in the charging pump vendor technical manual, impacting an operability determination on December 13, 2015. Dominion has entered the concern associated with the charging pump operability acceptance criteria into their corrective action program under CR1021512.

This finding was determined to be more than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," dated September 7, 2012, because it was associated with the equipment performance attribute of the Reactor Safety – Mitigating Systems cornerstone and adversely affected its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Further, this finding was found to be consistent with more than minor examples 3.j and 3.k of IMC 0612, Appendix E, "Examples of Minor Issues," dated August 11, 2009. This finding was evaluated in accordance with IMC 0609, "Significance Determination Process," Attachment 4, "Initial Characterization of Findings," and IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions", Section A, "Mitigating Systems, Structures or Components and Functionality," and screened to Green since it was not a qualification or design deficiency, did not represent a loss of system or function, and did not exceed its TS allowed outage time. Inspectors identified a cross-cutting aspect in the Human Performance cross-cutting area associated with Documentation in that Dominion lacked technical documentation to support the operability assertion in the charging pump operating procedure to address contrary guidance provided in the charging pump vendor manual. (H.7)

Inspection Report# : [2015004](#) (*pdf*)

Significance:  Dec 31, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

Turbine Driven Auxiliary Feedwater Pump Corrective Actions to Prevent Recurrence

The inspectors identified a green NCV of 10 CFR 50 Appendix B, Criterion XVI, Corrective Action, for Dominion's failure to take corrective action to prevent recurrence for a significant condition adverse to quality according to the definition in PI-AA-200, "Corrective Action." Specifically, PI-AA-200 lists "unplanned entry into a technical specification (TS) action that results in taking a unit off-line" as an example of a significant condition adverse to quality. On July 26, 2014, Dominion performed a shutdown of Unit 2 upon expiration of the allowed outage time of TS action statement 3.7.1.2 for the turbine driven auxiliary feedwater pump. Dominion cancelled the root cause evaluation assigned to investigate the cause of the plant shutdown, stating that the direct cause of the shutdown was

foreign material in the flow orifice. No corrective actions to prevent recurrence (CAPRs) were assigned after the direct cause was determined. Dominion entered this issue into their corrective action program as CR 1019514.

This performance deficiency was determined to be more than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," dated September 7, 2012, because it was associated with the equipment performance attribute of the Reactor Safety – Mitigating Systems cornerstone and adversely affected its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, taking corrective actions to prevent recurrence will help to ensure the availability and reliability of the turbine driven auxiliary feedwater pump. This finding was evaluated in accordance with IMC 0609, "Significance Determination Process," Attachment 4, "Initial Characterization of Findings," and IMC 0609, Appendix A, Exhibit 2, and screened to Green since it was not a qualification or design deficiency, did not represent a loss of system or function, and did not exceed its TS allowed outage time. The inspectors determined this issue had a cross cutting aspect in Human Performance, Consistent Process, where individuals use a consistent, systematic approach to make decisions. Specifically, Dominion inappropriately used the corrective action procedure to change the causal evaluation category without properly balancing the risk of the decision, and therefore did not develop corrective actions to prevent recurrence for a significant condition adverse to quality. (H.13)

Inspection Report# : [2015004](#) (*pdf*)

Significance:  Nov 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Implement Procedural Guidance During a Loss of RCS Inventory

The NRC identified a Green NCV of Millstone Power Station Unit No. 2 Technical Specifications (TS) 6.8.1, "Procedures" involving Dominion's failure to implement procedural steps when prompted by plant conditions to mitigate the event. Specifically, when pressurizer (PZR) level began to decrease while placing the shutdown cooling (SDC) system in service, the crew did not implement procedural guidance in OP-2207, "Plant Cooldown," nor enter AOP 2568A, "RCS Leak, Mode 4, 5, 6, and Defueled," as these procedures would have directed operators to locate the source of the leak. Later in the event, once the procedural guidance was implemented, action was taken to identify the location of the leak and it was isolated. After the event, selected crew members were removed from watch standing duties pending remediation. Dominion entered this issue into their corrective action program as CR1012358. The finding was more than minor because it is associated with the human performance attribute of the Mitigating Systems cornerstone and adversely affected its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, when entry conditions were met, operators did not implement procedural guidance that would have directed them to locate the source of the leak. The finding screened to very low safety significance (Green) using Manual Chapter 0609, Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process Phase 1 Screening and Characterization of Findings," Exhibit 3 - Mitigating Systems Screening Questions. Specifically, the finding did not represent a loss of system safety function. This finding had a cross-cutting aspect in the area of Human Performance, Procedure Adherence, in that licensed operators are expected to implement processes, procedures, and work instructions. Specifically, Dominion operators did not implement procedural guidance when prompted by plant conditions immediately after starting the "A" Low Pressure Safety Injection Pump (LPSI).

Inspection Report# : [2015012](#) (*pdf*)

Significance:  Nov 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure of the STA to Support the Crew During a Plant Cooldown

The NRC identified a Green NCV of Millstone Power Station Unit No. 2 TS 6.8.1, "Procedures" involving the shift technical advisor's (STA's) failure to follow position-specific procedural guidance, to support all phases of plant

operation. Specifically, the STA was not involved in providing independent, objective, and technical assessment of plant conditions when PZR level began to decrease when SDC was being placed in service and during the subsequent cooldown. Later in the event, the STA did provide support to the crew to confirm the existence of a leak. After the event, the STA was removed from watch standing duties pending remediation. Dominion entered this issue into their corrective action program as CR1012358.

The finding was more than minor because it is associated with the human performance attribute of the Mitigating Systems cornerstone and adversely affected its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, during the initiation and operation of the SDC system, the STA did not provide sufficient technical input to aid the crew in the determination of the existence of a reactor coolant system leak. The finding screened to very low safety significance (Green) using Manual Chapter 0609, Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process Phase 1 Screening and Characterization of Findings," Exhibit 3 - Mitigating Systems Screening Questions. Specifically, the finding did not represent a loss of system safety function. This finding had a cross-cutting aspect in the area of Human Performance, Teamwork, in that individuals and work groups communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety is maintained. Specifically, the STA did not fulfill his responsibilities to support the crew by assessing plant conditions during the initiation and operation of the SDC system during the plant cooldown.

Inspection Report# : [2015012](#) (pdf)

Significance: G May 01, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

Reactor Building Closed Cooling Water System Pump Oil Leakage Results in Technical Specification Inoperability

The team identified a non-cited violation (NCV) of Millstone Power Station Unit 2, Technical Specification (TS) 3.7.3.1 the reactor building component cooling water (RBCCW) system Limiting Condition of Operation (LCO) in that Dominion failed to maintain two loops of RBCCW operable. The team found that following the identification of a degraded condition for the "C" RBCCW pump, Dominion incorrectly concluded the loop remained operable. Specifically, the team determined that from February 4 to February 23, 2015, the RBCCW "B" loop was inoperable because oil leakage from the "C" RBCCW outboard pump bearing would have caused the complete loss of oil to the pump bearing, without operator compensatory action, before the "C" RBCCW train would have completed its design basis 30-day mission time. Using IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," Section A, "Mitigating Systems, Structures or Components and Functionality," the team determined that the finding required a detailed risk evaluation due to actual loss of function of at least a single train for greater than its TS allowed outage time. The Region I Senior Reactor Analyst (SRA) identified that because the finding involved the "C" RBCCW pump function to run for its mission time, the only accident events adversely impacted are the large break loss of coolant accident (LLOCA) sequences. The condition was conservatively modeled assuming an exposure period of one year with the "C" RBCCW pump failure to run basic event set to True. The resultant change in risk was estimated at mid E-8, or very low safety significance (Green). The dominated risk sequences involve a LLOCA with the failure of the remaining RBCCW pumps due to common cause. Since the estimated risk increase was less than 1E-8, no additional evaluation of external events contribution or change in large early release frequency (LERF) was required. The team concluded that this issue has a cross-cutting aspect in the Human Performance cross-cutting area of Conservative Bias: Individuals use decision-making practices that emphasize prudent choices over those that are simply allowable. A proposed action is determined to be safe in order to proceed, rather than unsafe in order to stop. Specifically, Dominion determined that the qualitative bubbler leak rate was acceptable without

evaluation against quantified operability criteria. (H.14)

Inspection Report# : [2015007](#) (*pdf*)

Significance: G May 01, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Provide 10 CFR 50.59 Evaluation for Interim Action Associated with Implementation of Operability Determination Procedure

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

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

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

Inspection Report# : [2015007](#) (*pdf*)

Significance: G May 01, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

Inadequate Evaluation of Circuit Breaker Interrupting Capability

The team identified a finding of very low safety significance (Green) involving a non-cited violation (NCV) of Title 10 of the Code of Federal Regulations (10 CFR) Part 50, Appendix B, Criterion III, “Design Control,” in that Dominion did not correctly evaluate the capability of 4.16 kV breakers to function properly during 3-phase bolted fault design condition. The team reviewed Millstone Unit 2 electrical distribution system analysis calculation (MP2-

ENG-ETAP-04014E2), which evaluated adequacy of the circuit breakers for their interrupting rating in accordance with the Institute of Electrical and Electronics Engineers/American National Standards Institute (IEEE/ANSI) C37 series standards, and determined that Dominion's shortcircuit fault current calculation did not assume the maximum plant operating voltage as a pre-fault voltage at the 4.16 kV bus and did not evaluate the plant configuration when emergency diesel generators (EDG) are operating in parallel with offsite power on the associated 4.16 kV emergency bus. The team determined this short-circuit fault current calculation was not in accordance with IEEE/ANSI C37 series standards and was non-conservative in some cases. Dominion entered the issue into their corrective action program and performed additional analysis to determine if the inability of the breaker to interrupt the fault current would result in the fault current affecting the other safety related bus. Dominion concluded that the other bus would not be affected. The team reviewed the analysis and determined it to be acceptable. The finding was determined to be more than minor because it was associated with the Mitigating Systems cornerstone Design Control attribute and adversely affected the cornerstone's objective and was similar to Example 3.j in Appendix E of the NRC IMC 0612. Using the NRC IMC 0609, "Significance Determination Process," Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," the finding was determined to be of very low safety significance (Green). There was no crosscutting aspect assigned to the finding because it was not an indicative of current performance.

Inspection Report# : [2015007](#) (*pdf*)

Significance: G Mar 31, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Replace Defective Fuses in the "A" EDG Resulting in Generator Failure

The inspectors identified a Green, Non-Cited Violation of 10 CFR 50, Appendix B, Criterion XVI associated with Dominion's failure to prevent recurrence of a significant condition adverse to quality, installation of defective fuses in the Unit 2 EDGs from September 26, 2015 until October 23, 2015. Dominion took corrective actions to replace the defective fuses in both EDGs and assess the extent of condition in other safety systems.

This finding was determined to be more than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," dated September 7, 2012, as it represented a challenge to the equipment performance attribute of the Reactor Safety – Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. This finding screened to be of very low safety significance because the finding did not represent an actual loss of function of a single train for greater than its allowable outage time. The inspectors assigned a cross-cutting aspect in the Problem Identification and Resolution cross-cutting area associated with Operating Experience, in that Dominion failed to effectively implement relevant internal and external operating experience. [P.5]

Inspection Report# : [2015001](#) (*pdf*)

Barrier Integrity

Emergency Preparedness

Occupational Radiation Safety

Public Radiation Safety

Security

Although the Security Cornerstone is included in the Reactor Oversight Process assessment program, the Commission has decided that specific information related to findings and performance indicators pertaining to the Security Cornerstone will not be publicly available to ensure that security information is not provided to a possible adversary. Other than the fact that a finding or performance indicator is Green or Greater-Than-Green, security related information will not be displayed on the public web page. Therefore, the [cover letters](#) to security inspection reports may be viewed.

Miscellaneous

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