Braidwood 1
4Q/2014 Plant Inspection Findings

Initiating Events

Mitigating Systems

Significance: G Dec 31, 2014
Identified By: NRC
Item Type: NCV NonCited Violation
FAILURE TO ADEQUATELY EVALUATE OPERABILITY FOLLOWING THE DISCOVERY OF AN UNANALYZED CONDITION INVOLVING THE PROBABLE MAXIMUM PRECIPITATION EVENT
The inspectors identified a finding of very low safety significance (Green) and an associated NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," when licensee personnel failed to adhere to Operability Determination Process standards after identifying an unanalyzed condition that had the potential to adversely impact numerous safety-related systems during a probable maximum precipitation (PMP) event. The issue was entered into the Corrective Action Program (CAP) as Issue Report (IR) 2396124. Corrective actions for this issue included performing an operability evaluation. The performance deficiency was more than minor in accordance with IMC 0612, Appendix B, "Issue Screening" because the issue was associated with the Protection Against External Factors attribute of the Mitigating System cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the licensee evaluated an unanalyzed condition utilizing another power plant's licensing basis in a manner that was not accurate and was not adequate. The finding was of very low safety significance (Green) because the potentially impacted systems remained operable. The finding had a cross-cutting aspect of Avoid Complacency in the Human Performance area. Specifically, the licensee failed to recognize and plan for the possibility of mistakes and plant specific differences between Braidwood and Byron while using Byron's current licensing basis to evaluate a Braidwood condition not previously analyzed (H.12).

Inspection Report# : 2014005 *(pdf)*

Significance: G Dec 31, 2014
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
FAILURE TO CORRECT UNDERSIZE ESSENTIAL SERVICE WATER PUMP BEARING CASING DRAIN LINE RESULTED IN SYSTEM INOPERABILITY
A finding of very low safety significance (Green) and an associated NCV of 10 CFR 50, Appendix B, Criterion III, "Design Control" was self-revealed following the licensee's failure to design the 1B essential service water (SX) pump inboard bearing casing drain line in a manner that ensured pump operability. Specifically, the licensee had re-designed the 1B SX pump inboard bearing drain line by replacing a hard pipe drain with a flexible hose drain line consisting of fittings of a smaller diameter when compared to the previous hard pipe drain line. This design change resulted in unplanned 1B SX pump inoperability and required operator action to secure the pump to preclude pump damage. The licensee entered this issue into the CAP as IR 2413941. Corrective actions included restoring adequate drain flow by replacing the flexible hose drain line with a hard pipe of a larger diameter. The performance deficiency

was of more than minor safety significance because the issue was associated with the Equipment Performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the failure to adequately design the 1B SX pump inboard bearing housing drain line resulted in an inoperable 1B SX pump. The finding was of very low safety significance (Green) because the inspector answered 'No' to all of the associated Mitigating Systems screening questions within IMC 0609, Attachment 4, "Initial Characterization of Findings." The finding is associated with the cross-cutting area of Problem Identification and Resolution with an aspect of Evaluation because the licensee did not thoroughly evaluate plant design in a manner commensurate with the safety significance. Specifically, the licensee inappropriately evaluated the design of the 1B SX pump inboard bearing housing drain line after identifying that the drain line size was the contributing cause for a loss of oil inventory in December 2013 (P.2).

Inspection Report# : 2014005 *(pdf)*

Significance: G Dec 31, 2014
Identified By: NRC
Item Type: NCV NonCited Violation
FAILURE TO EVALUATE IMPACT OF PROBABLE MAXIMUM PRECIPITATION EVENT ON TURBINE BUILDING FLOODING AS ASSOCIATED SAFETY-RELATED SSCs
The inspectors identified a finding of very low safety significance (Green) and an associated NCV of 10 CFR 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to assess the impact of plant modifications on the PMP event analysis in the plan design basis. Specifically, the licensee failed to determine if modifications to plant grading that caused higher water levels during a PMP event would adversely affect safety-related equipment. The licensee entered this issue into the CAP as IR 2413941. Corrective actions included performing an operability determination to ensure safety until a formal quality design review can be completed at a later date. The performance deficiency was more than minor in accordance with IMC 0612, Appendix B, "Issue Screening," because the issue was associated with the Protection Against External Factors attribute of the Mitigating System cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences
(i.e., core damage). Specifically, the licensee failed to evaluate the design to ensure that the consequences of the licensing basis PMP would be acceptable with respect to NRC regulations. The finding was of very low safety significance (Green) because it did not result in the loss or degradation of equipment or function specifically designed to mitigate a seismic, flooding, or severe weather initiating event. The finding had a
cross-cutting aspect of Design Margins in the Human Performance area. Specifically, the licensee did not carefully guard design margins when making station grade modifications that could adversely affect safety-related equipment during a heavy rainfall event. This issue was determined to be indicative of recent performance based upon two recent major revisions to station calculation WR–BR–PF–10, Local PMP Analysis, which evaluated the acceptability of recent grade modifications at the station (H.6).
Inspection Report# : 2014005 *(pdf)*

Significance: G Sep 30, 2014
Identified By: NRC
Item Type: NCV NonCited Violation
ADVERSE IMPACT OF FLOOR DRAIN DESIGN ON FLOODING ANALYSIS
The inspectors identified a finding of very low safety significance and an associated NCV of 10 CFR Part 50, Appendix B, Criterion III "Design Control," when licensee personnel failed to verify the design of bag-strainers in the floor drains of the auxiliary building and their impact on the associated flooding analysis. Specifically, when Calculation 3C8–0686–002, "Auxiliary Building Flood Level Calculation," was revised on May 16, 2013, the licensee credited the use of floor drains, which had bag-type strainers that were designed in such a way that they increased the

potential for blockage, and therefore adversely impacted the analysis of record for internal flooding. This issue was entered into the licensee's Corrective Action Program (CAP) as Issue Report (IR) 2385204, "NRC Questions on Aux [Auxiliary] Building Flood Evaluation." Corrective actions for this issue included instituting Standing Order 14–005 to prevent the interim removal of flood seals, and a plan to revise Calculation 3C8–0685–002 to resolve the identified non-conformances. The inspectors determined that the performance deficiency was more than minor in accordance with IMC 0612, Appendix B, "Issue Screening," because the issue was associated with the Design Control attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the floor drain strainer bags were inadequately designed in such a manner that instead of ensuring that the floor drains would be able to function properly to remove flood water, they would act to increase the possibility that the floor drains would become plugged and unable to perform this function adequately. The inspectors concluded that the finding was of very low safety significance in accordance with IMC 0609, Appendix A, Exhibit 2 and Exhibit 4. The inspectors determined that the finding had a cross-cutting aspect in the Evaluation component of the Problem Identification and Resolution (PI&R) cross-cutting area because the licensee failed to thoroughly evaluate the issue to ensure that the resolution addressed the causes. Specifically, when the licensee made a major revision to Calculation 3C8–0685–002 in 2013 to, in part, incorporate minor revisions and address non-conservatisms in the calculation, the licensee failed to adequately consider a previous minor revision that had removed credit for the drain system due to problems with its design that were previously identified by the NRC (P.2).
Inspection Report# : 2014004 *(pdf)*

Significance: G Sep 30, 2014
Identified By: NRC
Item Type: NCV NonCited Violation
MULTIPLE FAILURES TO FOLLOW OPERABILITY EVALUATION PROCESS FOLLOWING DISCOVERY OF A NON-CONFORMING CONDITION IN THE ULTIMATE HEAT SINK
The inspectors identified a finding of very low safety significance and an associated NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," when licensee personnel failed to follow procedure OP–AA–108–115, "Operability Determinations." Specifically, licensee personnel failed to adhere to numerous Operability Determination Process standards after identifying a non-conforming condition that had the potential to impact the operability of the Ultimate Heat Sink (UHS). This issue was entered into the licensee's CAP as IR 1674557, "Question on UHS License Amendment Request Impact on Pumps," and IR 1675291, "Unanalyzed Condition Identified During IR 1674557 Response." Corrective actions included correcting the non-conforming condition by revising the abnormal operating procedures to be aligned with the current licensing basis (CLB). The inspectors determined that the performance deficiency was more than minor in accordance with IMC 0612, Appendix B, "Issue Screening," because the issue was associated with the Design Control attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, based on the analysis of record, at the time of discovery there was reasonable doubt that the UHS could meet its mission time of 30 days. The inspectors determined that the finding was of very low safety significance in accordance with IMC 0609, Appendix A, Exhibit 2, since it was determined to not represent a confirmed loss of operability. The inspectors concluded that this finding had a cross-cutting aspect in the Conservative Bias component of the Human Performance cross-cutting area because the licensee failed to use conservative assumptions in their decision-making when evaluating the operability of the UHS. Specifically, operations did not request a documented evaluation to support understanding why the UHS was operable and to verify that their assumptions regarding operator actions were feasible (H.14).
Inspection Report# : 2014004 *(pdf)*

Significance: G Sep 30, 2014
Identified By: Self-Revealing

Item Type: NCV NonCited Violation
STATION DIESEL DRIVEN FIRE PUMP RESTORED TO SERVICE NON-FUNCTIONAL DUE TO INCORRECT STOP PUSH BUTTON SWITCH REPLACEMENT
A finding of very low safety significance and an associated NCV of Braidwood Operating License Condition 2.E, "Fire Protection Program," was self-revealed during the performance of a scheduled diesel-driven fire pump (DDFP) sequential start surveillance when the DDFP was observed by operators to start, but then cycle on and off. The DDFP was declared non-functional and a subsequent causal evaluation determined that an incorrectly designed DDFP stop pushbutton switch had been installed several months prior to the identification of the issue. The licensee entered this issue into their CAP as IR 1649515, "Incorrect Stop Pushbutton Installed on 0B Fire Pump." Corrective actions included replacing the switch with a switch of a correct design. The inspectors determined that the performance deficiency was more than minor in accordance with IMC 0612, Appendix B, "Issue Screening," because the issue was associated with the Equipment Performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the performance deficiency resulted in a non-functional DDFP. The finding was determined to be of very low safety significance by a NRC Senior Reactor Analyst. The inspectors concluded that this finding had a cross-cutting aspect in the Avoid Complacency component of the Human Performance cross-cutting area because the licensee did not adequately recognize and plan for the possibility that the DDFP stop pushbutton replacement switch design could have been different than plant-specific design requirements (H.12).
Inspection Report# : 2014004 *(pdf)*

Significance: G Mar 31, 2014
Identified By: NRC
Item Type: NCV NonCited Violation
INADEQUATE AOP ENTRY CRITERIA FOR INTAKE FRAZIL ICING CONDITIONS
The inspectors identified a finding of very low safety significance and an associated NCV of TS 5.4.1, "Procedures" when licensee personnel failed to specify adequate entry conditions in the station Abnormal Operating Procedure (AOP) that would be utilized to monitor and mitigate a frazil icing event at the lake screen house. Specifically, the licensee had established the entry condition of (Lake Temperature = 32 °F) without adequately considering the resources available to the control room operators and supervisors and without accounting for the necessary margin. The licensee entered this issue into their Corrective Action Program as Issue Reports (IRs) 1613506, and 1617385. Corrective action consisted of changing the entry conditions based specifically upon essential service water temperature with margin to account of uncertainty and heat input. The inspectors determined that the performance deficiency was more than minor because it was associated with the Procedural Quality attribute of the Mitigating System cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, failure to establish and maintain adequate entry conditions into this station AOP could result in additional time for ice to accumulate on plant components before mitigating actions would be initiated. Any delay in mitigating this type of event could increase the likelihood of a loss or partial loss of essential service water event or other type of transient (e.g., loss of instrument air, and reactor trip). A detailed risk evaluation was performed by an NRC Regional Senior Risk Analysis and the significance of this finding was determined to be of very low safety significance (Green). This finding did not have an associated cross cutting aspect because the inspectors determined that the most significant cause of the error was when the entry criteria was established in November 2010 and, therefore, not indicative of recent performance.

Inspection Report# : 2014002 *(pdf)*

Significance: G Mar 31, 2014
Identified By: NRC

Item Type: FIN Finding
FAILURE TO ENSURE MITIGATING SYSTEM AVAILABILITY AND RELIABILITY DURING WEATHER CONDITIONS THAT COULD PROMOTE FRAZIL ICE AT THE LAKE SCREEN HOUSE
The inspectors identified a finding of very low safety significance when licensee personnel failed to ensure that the LSH trash rake would be capable of clearing ice buildup on the trash rake bars. Specifically, the licensee failed to ensure that the trash rake system was functional prior to the onset of weather conditions that could promote frazil ice production and after a repair following a trash rake failure during those conditions. The licensee entered this issue into their CAP as IR 1613767, "LSH Trash Rake Will Not Traverse on Rails." The licensee corrected this issue by utilizing a vendor to re-furbish and repair the trash rake. Additionally, the licensee revised their procedures to include additional methods to clear ice from the trash bars. The inspectors determined that the performance deficiency was more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the failure to have any mitigating systems available during weather conditions that could promote frazil icing of the lake intake increased the likelihood of a plant transient including a loss of essential service water event. A detailed risk evaluation was performed by an NRC Regional SRA and the finding was determined to be of very low safety significance (Green). This finding had a cross cutting aspect in the Restoration component of the Problem Identification and Resolution cross-cutting area because the organization failed to take effective corrective action to address a non-functioning LSH trash rake in a timely manner commensurate with safety after restoring the equipment to Operations for use during weather conditions that could promote frazil icing conditions.
Inspection Report# : 2014002 *(pdf)*

Significance: G Mar 31, 2014
Identified By: NRC
Item Type: NCV NonCited Violation
FAILURE TO IDENTIFY FIRE DOORS THAT DO NOT CONFORM TO NFPA CODES AND STANDARDS
The inspectors identified a finding of very low safety significance and an associated NCV of Braidwood Operating License Condition 2.E, "Fire Protection Program," when licensee personnel failed to identify fire doors that did not conform to the current licensing basis standard within the National Fire Protection Agency (NFPA) 80 Code that required fire doors to automatically shut and latch without assistance. Specifically, station personnel were not adequately performing a daily fire door testing procedure and, as a result, failed to identify a number of fire doors that were not conforming to the standard. As a result, IRs were not generated when degraded conditions existed. The licensee entered this issue into their CAP as IR 1629689, "Unclear Direction in 0BwOS FP.7.2.D-1." Corrective actions included training plant operators on the expectations regarding generation of IRs for any abnormal condition in the plant, and requiring the use of a copy of the surveillance procedure in the field while completing the daily fire door surveillance. The inspectors determined that the performance deficiency was more than minor because it is associated with the Protection Against External Factors attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, licensee personnel did not identify a number of fire doors that were not capable of closing and latching without assistance, which impacted the door's ability to perform its design function. Using IMC 0609, Appendix F, Attachment 1, "Fire Protection Significance Determination Process Worksheet," the inspectors determined that the finding category was "Fire Confinement," and that the finding did not impact the ability of the plant to achieve safe shutdown. As a result, the finding screened as having very low safety significance (Green). This finding had a cross cutting aspect in the Procedure Adherence component of the Human Performance cross-cutting area because licensee personnel did not follow procedures, processes and work instructions. Specifically, the licensee did not have the fire door testing procedure in hand while performing the surveillance and did not follow the procedure steps.

Inspection Report# : 2014002 *(pdf)*

Barrier Integrity

Emergency Preparedness

Significance: G Sep 30, 2014
Identified By: NRC
Item Type: NCV NonCited Violation
INADEQUATE EVACUATION TIME ESTIMATE SUBMITTALS
The NRC identified a finding of very low safety significance and an associated NCV of 10 CFR 50.54(q)(2) related to 10 CFR 50.47(b)(10) and 10 CFR Part 50, Appendix E, Section IV.4, for failing to maintain the effectiveness of the Braidwood Station Emergency Plan as a result of failing to provide the station Evacuation Time Estimate (ETE) to the responsible offsite response organizations by the required due date. Exelon submitted the Braidwood Station ETE to the NRC on December 12, 2012, prior to the required due date of December 22, 2012. However, an NRC review found the ETE to be incomplete due to Exelon fleet common and site-specific deficiencies, thereby preventing Exelon from providing the ETE to responsible offsite response organizations and from updating site-specific protective action strategies as necessary. The NRC discussed its concerns regarding the completeness of the ETE in a teleconference with Exelon on June 10, 2013, and on September 5, 2013, Exelon resubmitted the ETEs for its sites. Subsequently, the NRC again found the ETE to be incomplete. Exelon's failure to submit a complete updated ETE for Braidwood Station by December 22, 2012, was a licensee performance deficiency because the issue was a failure to comply with a regulatory requirement and the issue was reasonably within the licensee's ability to foresee and correct, and therefore should have been prevented. The inspectors determined the performance deficiency was more than minor because it was associated with the Emergency Preparedness cornerstone attribute of Procedure Quality and adversely affected the cornerstone objective of ensuring that the licensee was capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. The finding was of very low safety significance because it was a failure to comply with a non-risk significant portion of 10 CFR 50.47(b)(10). The licensee entered this issue into their CAP and re-submitted a new revision of the Braidwood Station ETE to the NRC on May 2, 2014. The inspectors concluded that this finding had a cross-cutting aspect in the Documentation component of the Human Performance cross-cutting area (H.7).

Inspection Report# : 2014004 *(pdf)*

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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