

Braidwood 1

2Q/2010 Plant Inspection Findings

Initiating Events

Significance:  Dec 31, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO FULLY IMPLEMENT ABNORMAL OPERATING PROCEDURES FOLLOWING A SEISMIC EVENT

The inspectors identified a Green finding and an associated Non-Cited Violation of Technical Specification 5.4.1 for the failure to fully implement an abnormal procedure following a seismic event. Specifically, on April 18, 2008, following a seismic event, the licensee chose to perform field walkdowns to verify that sulfuric acid and sodium hypochlorite tanks were intact rather than to isolate control room ventilation as required by Procedure 0BwOA ENV-4, "Earthquake." As a corrective action, the licensee performed training activities to clarify when procedural deviations are allowed. The finding was determined to be more than minor because it impacted the procedure quality attribute of 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 inspectors evaluated the finding in accordance with IMC 0612, Appendix B, "Issue Screening." The inspectors performed a significance evaluation in accordance with IMC 0609, Attachment 4, "Determining the Significance of Reactor Inspection Findings for At-Power Situations." The inspectors answered 'No' to the external event initiators question in the Initiating Events Cornerstone column of Table 4a and the issue screened as one of very low safety significance. This finding is associated with the cross-cutting attribute of decision making in the Human Performance cross-cutting component (H.1(b)). Specifically, the licensee did not use conservative assumptions in the decision to send an operator to locally verify rather than perform a procedural step from the control room as written. In the event the sulfuric acid and sodium hypochlorite tanks were damaged, the control room operators could have been impacted with chlorine gas prior to receiving verification from the locally dispatched operator since the licensee elected not to isolate control room ventilation.

Inspection Report# : [2009005](#) (*pdf*)

Mitigating Systems

Significance:  Apr 02, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

DDAFW Pump Battery Racks were not restored to their Design Basis Seismic Category I

The inspectors identified an NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," having very low safety significance for the licensee's failure to restore the Diesel Driven Auxiliary Feedwater (DDAFW) battery racks to their design basis qualification, Seismic Category I. Specifically, although the licensee identified the existence of gaps between the wooden spacer blocks, batteries and end of racks in 2004 the licensee failed to provide adequate justification to demonstrate that the existing condition still met the Seismic Category I Design Basis requirements as specified in their design documents. The gaps between the wooden spacer blocks could affect the reliability of the DDAFW DC safety-related batteries being that this component was outside its design basis for over a period of six years. The licensee subsequently entered the issue into their corrective action program and restored the batteries racks to their design requirements.

The finding was more than minor because it was associated with the Mitigating Systems cornerstone attribute of equipment performance, and affected the cornerstone objective of ensuring the availability of DDAFW batteries to

perform their safety function in external events to prevent undesirable consequences. Specifically, the licensee did not assure that the wooden spacer blocks including the gap would provide adequate support to ensure that the seismically qualified battery rack will perform its safety function. This finding is of very low safety significance (Green) because the qualification deficiency was confirmed not to result in loss of operability or functionality. The inspectors determined that there was no cross-cutting aspect associated with this finding because the gaps between the wooden spacers and the DDAFW batteries were initially identified in 2004; therefore, the finding was not indicative of the plant's current performance.

Inspection Report# : [2010007](#) (pdf)

Significance:  Apr 02, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

Lack of Calculation for the DDAFW Minimum Fuel oil Tank Setpoint Level

The inspectors identified an NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," having very low safety significance related to the licensee's failure to develop a calculation for the DDAFW pump minimum fuel oil tank level setpoint. Specifically, the licensee failed to perform a calculation specific to the DDAFW pump day tank to verify the 74 percent level indication was equivalent to the 420 gallons of usable fuel volume that was required by the Technical Specifications (TS). The licensee subsequently entered the issue into their corrective action program to develop design basis documentations.

This finding is more than minor because it was associated with the Mitigating Systems cornerstones attribute of design control and affected the cornerstone objective of ensuring the capability of the safety-related system to respond to initiating events to prevent undesirable consequences. Specifically, the licensee failure to verify that 74 percent tank level exceeded the TS value did not assure the pump was capable of performing its safety function for the entire seven hours mission time. This finding is of very low safety significance (Green) because subsequent calculation/evaluation determined the volume of the tank at 74 percent level was slightly above the minimum required TS limit. The inspectors determined there was no cross-cutting aspect associated with this finding because the deficiency was a legacy design issue and, therefore, was not indicative of the plant's current performance.

Inspection Report# : [2010007](#) (pdf)

Significance:  Apr 02, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

Potential Clogging of Essential Service Water (SX) Throttle Valves for Pump Room Coolers

The inspectors identified an NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," having very low safety significance for the licensee's failure to include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished. Specifically, the licensee's procedures for flow balancing Essential Service Water (SX) supply to safety-related pump room coolers did not include any precautionary statements to limit the degree to which branch loop throttle valves could be throttled down without introducing concerns about potential clogging from particulate in the service water and resultant flow reduction. The licensee subsequently entered the issue into their corrective action program and performed immediate corrective actions included, engineering evaluation to determine current operability, repositioned all throttle valves to at least $\frac{3}{4}$ turns open and revised the valve throttling procedure to prevent any valve from being throttled to less than $\frac{3}{4}$ turns open in the future.

The finding was more than minor because it was associated with the Mitigating Systems cornerstone attribute of procedure quality and affected the cornerstone objective of ensuring the capability of the system to respond to initiating events to prevent undesirable consequences. Specifically, under accident conditions, the position of these throttle valves could have led to a potential degradation of the ability of the room coolers to perform their safety-related function of protecting the emergency core cooling system (ECCS) pumps from elevated environmental temperatures. The finding is of very low safety significance (Green) because the design deficiency did not contribute to the likelihood that mitigating equipment or functions would not be available. The inspectors determined there was no cross-cutting aspect associated with this finding because the deficiency was a legacy procedural issue and, therefore, was not indicative of the plant's current performance.

Inspection Report# : [2010007](#) (pdf)

Significance:  Apr 02, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

Adverse Impact of Flood Drain Strainer Design Modification on Flooding Analysis

The inspectors identified an NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," having very low safety significance for the licensee's failure to fully verify the adequacy of a design modification important to safety. Specifically, the licensee failed to recognize that bag-type strainers back fitted into floor drains in the Auxiliary Building for the purpose of preventing debris from blocking the floor drain piping were designed in such a way that they actually increased the potential for blockage, thus negatively impacting the analysis of record for internal flooding. The licensee subsequently entered the issue into their corrective action program, performed preliminary evaluation of the affected areas and demonstrated operability. Additional action was initiated to revise the internal flooding calculation and safe shutdown analysis to address the impact of the floor drain strainers.

The finding was more than minor because it was associated with the Mitigation Systems Cornerstone attribute of protection against external events such as flooding and affected the cornerstone objective of ensuring the availability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the floor drain strainer bags were inadequately designed such that they would have increased the possibility of drain plugging. The finding is of very low safety significance (Green) because the licensee was able to demonstrate that, in the event the drains became plugged in any room, a flood in the affected room would have not affected the alternate shutdown equipment. The inspectors determined there was no cross-cutting aspect associated with this finding because these bag-type strainers were installed in 1996; therefore, the finding was not reflective of current performance.

Inspection Report# : [2010007](#) (pdf)

Significance:  Apr 02, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

Non-Conservative Acceptance Criteria for CS Pump Performance Testing

The inspectors identified an NCV of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," having very low safety significance for the licensee's failure to ensure adequate acceptance limits were incorporated into test procedures. Specifically, the licensee failed to consider instrument loop uncertainties when determining the alert and required action values used in the IST procedure for testing of the containment spray (CS) pumps. Consequently, the acceptance criteria for both the upper and lower limits on total developed head (TDH) were non-conservative. As a result, the licensee subsequently entered the issue into their corrective action program, performed an operability evaluation and concluded equipment were operable. Additional corrective actions were assigned to investigate and correct the cause of the apparent degradation of the 2B CS pump.

The finding was more than minor because it was associated with the Mitigating Systems cornerstones attribute of equipment performance and affected the cornerstone objective of ensuring the capability of the system to respond to initiating events to prevent undesirable consequences. Specifically, the failure to consider instrument uncertainties in the development of IST acceptance criteria resulted in the creation of acceptance criteria values that did not ensure that the CS pump could meet its intended safety function. This finding is of very low safety significance (Green) because the licensee was able to demonstrate pumps operability; therefore, there was no loss of safety function. This finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Operating Experience, because the licensee failed to implement relevant information relating to failure to appropriately account for instrument uncertainties identified in Information Notice 2008-02 through changes to station procedures.

Inspection Report# : [2010007](#) (pdf)

Significance:  Apr 02, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

EDGs Fuel Oil Consumption Calculation Failed to Account for Frequency Variations

The inspectors identified an NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," having very low safety significance for the licensee's failure to translate the allowable frequency variations, for the emergency diesel generators (EDGs), into the fuel consumption calculation. Specifically, the fuel oil consumption calculation for the EDGs did not assure that TS minimum required fuel limit of 44,000 gallons was adequate to support the EDGs operating at frequency higher than 60 Hertz (Hz) for the seven days mission time. As a result of the inspectors' questions, the licensee subsequently added an action item to an existing condition report to address frequency variation on fuel consumption.

The finding was more than minor because it was associated with the Mitigating Systems cornerstones attribute of design control and affected the cornerstone objective of ensuring the capability of the system to respond to initiating events to prevent undesirable consequences. Specifically, the licensee failed to ensure that the minimum fuel required by TS of 44,000 gallons was adequate to support the EDGs mission time when operating at higher frequency than 60 Hz. This finding is of very low safety significance (Green) because the licensee was able to demonstrate that adequate fuel oil in the storage tanks would be available to support the EDGs when operating within the frequency variation band established by the administrative limits. This finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because the licensee did not thoroughly evaluate problems associated with safety nuclear safety.

Inspection Report# : [2010007](#) (pdf)

Significance: **W** Nov 03, 2009

Identified By: NRC

Item Type: VIO Violation

FAILURE OF CONTAINMENT SUMP SUCTION VALVE 1SI8811B TO STROKE OPEN

The inspectors identified a finding of substantial safety significance and an associated apparent violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the failure to prevent water from entering the motor operated valve actuator for valve 1SI8811B that resulted in corrosion of the torque switch. This resulted in the valve failing to stroke full open on June 24, 2009. The licensee determined that water entered the valve actuator through a flexible conduit penetration and pooled in the actuator limit switch box. This caused corrosion of the torque switch and minor corrosion of the limit switch. As part of the corrective actions for this event, the licensee sealed the susceptible conduit. Also, to address extent of condition, the licensee subsequently performed successful valve strokes of the 1SI8811A and 2SI8811A/B valves as part of previously scheduled maintenance windows. Additionally, the licensee performed a walkdown of the other SI8811 valves on both Units. Open conduit terminations were identified on all three remaining valves. The 2SI8811B valve was found to have the same susceptible conduit/cable tray configuration while the 1SI8811A and 2SI8811A valves had horizontal conduit terminations that were less susceptible to water intrusion. As a result, the licensee sealed the 2SI8811B valve open conduit termination. The inspectors determined that the finding was more than minor due to impacting the Equipment Performance attribute of the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capability of systems the respond to initiating events to prevent undesirable consequences. The finding associated with this apparent violation was assessed using a Phase 3 analysis in accordance with NRC Inspection Manual Chapter 0609 Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations," and is preliminary determined to have substantial significant safety significance (Yellow). The inspectors determined that this issue is associated with the Corrective Action Program component of the Problem Identification and Resolution cross-cutting area. (P.1(a)) Specifically, licensee staff was aware for several years of water leakage from the overhead areas around the SI8811 valves. Several corrective action documents were generated previously but the licensee did not adequately evaluate the potential safety significance of the water leakage and did not correct the issue.

Final Significance letter issued February 25, 2010 - characterized as WHITE.

Inspection Report# : [2009007](#) (pdf)

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

Significance: **G** Sep 30, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO PROVIDE CONTINUOUS MONITORING OF A FIRE DOOR

tection Program,” for the licensee’s failure to take adequate compensatory measures following the failure of electronic supervision of a fire door. Specifically, when continuous electronic supervision of a fire door in an area with gaseous fire suppression failed, the licensee did not establish an hourly fire watch as required by Procedure BwAP 1110-1, “Fire Protection Program System Requirements.” The inspectors determined that the licensee failed to take procedurally required compensatory measures for the loss of electronic fire door monitoring. Upon notification of these requirements by the inspectors, the licensee restored power to the system and entered the issue into the CAP as Issue Report (IR) 945777.

The inspectors determined the finding is more than minor because it is associated with the external events (fire) attribute of the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors determined the finding category was Fire Prevention and Administrative Controls and assigned a low degradation rating. Therefore, the finding screened as of very low safety significance. The cause of the finding is related to the work practices attribute of the cross-cutting element of Human Performance (H.4(b)). Specifically, procedures were in place that directed the appropriate compensatory measures for the loss of electronic monitoring of fire doors; however, the licensee did not implement those procedures.

Inspection Report# : [2009004](#) (pdf)

Significance:  Sep 30, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE OF THE LICENSEE'S STAFF TO PROPERLY MANAGE ON-LINE RISK ASSOCIATED WITH TESTING OF THE 2A AUXILIARY FEEDWATER PUMP SLAVE RELAYS

The inspectors identified a NCV of 10 CFR Part 50.65 (a)(4), due to the licensee’s failure to properly assess and manage the risk associated with scheduled slave relay testing for the 2A Auxiliary Feedwater (AF) system. Specifically, the licensee declared the system inoperable but available. However, the system at the time could neither automatically respond to an event, nor was an operator “dedicated” as defined in the NRC endorsed industry guidance, Nuclear Management and Resources Council (NUMARC) 93-01, to manually realign the system to perform its safety-related function for the system to be considered available. Corrective actions for this issue included assigning dedicated operators in accordance with NUMARC 93-01, Section 11. The inspectors did not identify a cross-cutting aspect for this issue. The finding is more than minor because there was elevated plant risk associated with the 2A AF pump being unavailable that would have required the implementation of additional risk management actions (i.e., assigning dedicated operators and/or maintenance personnel in accordance with NUMARC 93-01, Section 11). The inspectors assessed the safety significance of this finding using IMC 0609, Appendix K, “Maintenance Risk Assessment and Risk Management Significance Determination Process.” Using input from the licensee’s risk assessment engineer, the inspectors determined that the actual risk deficit was 1.5×10^{-7} . The finding was determined to be of very low safety significance because the actual risk deficit was determined to be less than 1×10^{-6} .

Inspection Report# : [2009004](#) (pdf)

Barrier Integrity

Significance:  Mar 31, 2010

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

PERFORMANCE OF TROUBLESHOOTING LEADS TO AUXILIARY BUILDING VENTILATION FAN FIRE

A finding of very low safety significance and an associated Non-Cited Violation of 10 CFR 50, Appendix B, Criterion V, “Procedures,” was self-revealed when, on January 9, 2010, auxiliary building ventilation fan OVA01CC caught fire, resulting in the declaration of an Unusual Event. Specifically, troubleshooting performed on the inboard fan bearing in Spring 2009 changed the bearing oil level without proper limits established, which led to bearing failure

due to lack of lubrication. The licensee's corrective actions included an evaluation of the oil consumption trends for other auxiliary building ventilation fans, additional training on work package quality, and a revision to other existing work orders that are intended to adjust auxiliary building ventilation fan oil levels.

The finding was more than minor because it impacted the Systems, Structures, and Components and Barrier Performance attribute of the Barrier Integrity cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. Because the finding only represented degradation, rather than loss, of the radiological barrier function provided for the auxiliary building it screened as an issue of very low safety significance (Green). This finding is associated with the cross-cutting area component of resources in the human performance cross-cutting area. Specifically, the work instructions for troubleshooting did not contain adequate guidance to adjust the oil bubbler without causing an adverse equipment impact (H.2(c)).

Inspection Report# : [2010002](#) (*pdf*)

Significance:  Sep 30, 2009

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

FAILURE OF FIRE PROTECTION VALVE STROKE PROCEDURE RESULTS IN TRIP OF B TRAIN OF MAIN CONTROL ROOM VENTILATION

A NCV of 10 CFR 50, Appendix B, Criterion V, was self-revealed on September 22, 2009, when performance of a fire protection valve stroke procedure resulted in a trip of the B Train of the Main Control Room Ventilation System. Specifically, conflicting procedural guidance resulted in operators stroking the B Train Main Control Room Recirculation Charcoal Absorber deluge valve, which resulted in an unexpected trip of the safety-related B train of Main Control Room Ventilation and entry into Technical Specifications (TS) 3.7.10 and 3.7.11. The licensee conducted trainings and briefings to the operators to identify the potential error traps in procedures and entered this issue into the corrective action program (CAP) as IR 968717. The finding is more than minor because it affected the procedure quality attribute of the Barrier Integrity Cornerstone objective to maintain the radiological barrier functionality of the control room. The inspectors answered 'No' to all questions in the Containment Barrier Column of IMC 0604, Attachment 4, Table 4a, "Characterization Worksheet for IE, MS, and BI Cornerstones," and the finding screened as having very low safety significance. This finding is associated with the cross-cutting attribute of decision making in the Human Performance cross-cutting component (H.1(a)). Specifically, when faced with uncertainty in procedural direction during performance of the fire protection valve surveillance, the licensee did not use a systematic process for decision making, which resulted in a trip of the B Train of Main Control Room Ventilation.

Inspection Report# : [2009004](#) (*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

Last modified : September 02, 2010