Braidwood 1
1Q/2016 Plant Inspection Findings

Initiating Events

Significance: G Mar 31, 2016
Identified By: NRC
Item Type: NCV Non-Cited Violation
FAILURE TO FOLLOW FIRE PREVENTION FOR HOT WORK PROCEDURE
The inspectors identified a finding of very low safety significance and an associated NCV of License Condition 2.E when licensee personnel failed to follow the requirements of the Fire Prevention for Hot Work procedure on two separate occasions. Specifically, (Issue 1) on February 2, 2016, a very small fire occurred during a planned hot work activity that involved pipe grinding on a small waste gas decay tank pressure line because the licensee failed to recognize the potential for hydrogen within the line. Additionally, (Issue 2) on February 25, 2016, the inspectors identified that a hot work permit was inadequate prior to the licensee performing a piping weld repair activity associated with the Unit 2 main generator stator cooling water system because the permit referenced the wrong work location and did not require appropriate controls. These issues were entered into the licensee's Corrective Action Program (CAP) as Issue Reports (IRs) 2620772 and 2632182. The inspectors determined that the performance deficiency was more than minor because it was associated with the Human Performance attribute of the Initiating Events cornerstone and adversely affected the cornerstone objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions during shutdown and power operations. Specifically, for Issue 1, the performance deficiency resulted in the occurrence of a small hydrogen fire in the auxiliary building. For Issue 2, the performance deficiency increased the likelihood of a fire occurring during an emergent weld repair in the turbine building. The inspectors determined that this finding was of very low safety significance (Green) because the fire (Issue 1) and increased likelihood of a fire occurring (Issue 2) was limited to equipment which was not important to safety. The inspectors determined that the finding had a Work Management cross cutting aspect in the Human Performance area. Specifically, a significant contributor to the performance deficiency was related to the organization not implementing a process for planning, controlling, and executing work activities such that nuclear safety is the overriding priority.

Inspection Report# : 2016001 *(pdf)*

Significance: G Dec 31, 2015
Identified By: Self-Revealing
Item Type: NCV Non-Cited Violation
FAILURE TO ESTABLISH ADEQUATE FEEDWATER PUMP OPERATIONAL GUIDANCE DURING PLANT SHUTDOWN
A finding of very low safety significance and an associated NCV of Technical Specification 5.4.1, "Procedures," was self-revealed on October 5, 2015, due to the licensee's failure to establish and maintain adequate guidance for operating the Unit 1 and Unit 2 motor driven main feedwater pump (MDFWP) during plant shutdown conditions. Specifically, on October 4, 2015, during a Unit 2 plant shutdown, the Unit 2 MDFWP was placed in service at low forward feedwater flow conditions and was manually tripped when the pump's main journal bearing temperature exceeded the procedural limit. Subsequent review, determined that the procedural limit was too low as previously recognized by historic station specific operating experience. This issue was entered into the licensee's corrective action program (CAP) as Issue Report (IR) 2565486. The inspectors determined that the performance deficiency was

more than minor because the issue was associated with the Procedural Quality attribute of the Initiating Event cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the performance deficiency contributed to a loss of main feedwater event that upset plant stability and challenged the critical safety function of removing decay heat via the steam generators in Mode 3. For Unit 1, the increased potential for a loss of main feedwater event existed under similar conditions. The inspectors determined that the finding was of very low safety significance based upon a detailed risk evaluation. The inspectors concluded that this finding did not have a cross cutting aspect because the performance deficiency was greater than 3 years old and, therefore, not indicative of recent performance.

Inspection Report# : 2015004 *(pdf)*

Significance: G Jun 30, 2015
Identified By: NRC
Item Type: NCV Non-Cited Violation
FAILURE TO UPDATE THE UFSAR - THIMBLE TUBE INSPECTION PROGRAM
The inspectors identified a Severity Level IV NCV of Title 10 of the Code of Federal Regulations (10 CFR) 50.71(e), “Periodic Update of the Updated Final Safety Analysis Report (UFSAR),” and an associated Green finding for the licensee’s failure to update the UFSAR with a description of the Thimble Tube Inspection Program to reflect information submitted to the NRC in response to NRC Bulletin 88-09. Specifically, the licensee did not update Section 5.2.4, “Inservice Inspection and Testing of Reactor Coolant Pressure Boundary,” of the UFSAR to include the Incore Thimble Tube Inspection Program, which provided the basis for leakage integrity for this portion of the reactor coolant pressure boundary. The licensee entered this issue into their Corrective Action Program (CAP) and identified a recommended action to incorporate the Incore Thimble Tube Inspection Program into the UFSAR. The 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, if left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern. Specifically, the failure to update the UFSAR with the Thimble Tube Inspection Program could result in reductions or elimination of the program without seeking prior NRC approval and insufficient thimble tube inspections could also result in the failure to detect thimble tube wear prior to an un-isolable leak in the reactor coolant pressure boundary. Additionally, the failure to update the UFSAR was more than minor because it was associated with the Initiating Events Cornerstone attribute of Equipment Performance and adversely affected the Cornerstone objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions. The finding screened as having very low safety significance (Green), because the licensee’s failure to update the UFSAR with a description of the Thimble Tube Inspection Program had not resulted in degradation of a thimble tube such that the reactor coolant system leak rate for a small break loss of coolant accident was exceeded and did not affect systems used to mitigate a loss of coolant accident. Therefore, the inspectors answered “No” to Questions A.1 and A.2, of Exhibit 1, “Initiating Events Screening Questions,” identified in Appendix A of IMC 0609 and the finding screened as having very low safety significance. Violations of 10 CFR 50.71(e) are dispositioned using the traditional enforcement process, because they are considered to be violations that potentially impede or impact the regulatory process. In accordance with Sections 6.1.c.7 and 6.1.d.3 of the NRC Enforcement Policy, this violation was categorized as Severity Level IV because the licensee’s failure to update the UFSAR as required by 10 CFR 50.71(e) had not yet resulted in an unacceptable change to the facility (e.g. thimble tube structural integrity was maintained) or procedures and the associated finding was of very low risk significance. The finding was the result of an error made in excess of 10 years ago, and thus was not indicative of current licensee performance. Therefore, no cross-cutting aspect was identified.
Inspection Report# : 2015002 *(pdf)*

Mitigating Systems

Significance: G Mar 31, 2016
Identified By: Self-Revealing
Item Type: NCV Non-Cited Violation
FAILURE TO CORRECT A CONDITION ADVERSE TO QUALITY LEADS TO LOSS OF ONE TRAIN OF SHUTDOWN COOLING IN MODE 6
A finding of very low safety significance and an associated NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," was self revealed when the licensee failed to ensure that a condition adverse to quality was promptly identified and corrected. Specifically, on October 8, 2015, valve 2RH606 failed to open and caused a loss of one train of shutdown cooling in Mode 6 and an unplanned orange risk condition. The reason for the failure was improper use of a lower strength carbon steel valve key instead of the specified high strength hardened steel valve key, which had been the subject of a vendor Part 21, "Reports of Defects and Non Compliance," Report. This issue was entered into the licensee's CAP as IR 2567811. 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. Specifically, the failure to correct a condition adverse to quality in the form of the improper use of a lower strength carbon steel key instead of the specified high strength hardened steel key in a safety-related valve ultimately led to a loss of one train of shutdown cooling in Mode 6. The inspectors determined that the finding was of very low safety significance based upon a detailed risk evaluation. The inspectors did not identify a cross cutting aspect associated with this finding because the performance deficiency was greater than three years old and therefore was not indicative of current performance.

Inspection Report# : 2016001 *(pdf)*

Significance: G Mar 31, 2016
Identified By: NRC
Item Type: FIN Finding
FAILURE TO ENSURE UNIT 2 STARTUP FEEDWATER PUMP AVAILABILITY
. The inspectors identified a finding of very low safety significance when licensee personnel failed to ensure that the Unit 2 startup feedwater pump (SUFWP) was available during an 18 month operating cycle. Specifically, the licensee had failed to ensure that the pump oil pressure regulator was properly adjusted, and had failed to perform a post-maintenance test following on-line work in a manner to ensure that no new deficiency was introduced. The license entered this issue into their CAP as IR 2565442. Corrective actions consisted of updating the station SUFWP model work orders (WOs) to ensure that interlock continuity checks were performed as a part of the post-maintenance testing when necessary, and to include procedural steps to verify lube oil pressure when starting a SUFWP. The inspectors determined that the performance deficiency was more than minor because the issue was associated with the Procedural Quality 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. Specifically, the Unit 2 SUFWP is a backup method of decay heat removal following a reactor trip, and is utilized in plant startup and shutdown procedures. A detail risk evaluation was performed and the performance deficiency was determined to be of very low safety significance based upon an evaluation bounding the risk to a Delta Core Damage Frequency (?CDF) of 2.9E–7/year. No cross cutting aspect was identified because the cause of the failure were probable causes and not confirmed to be the actual cause

Inspection Report# : 2016001 *(pdf)*

Significance: G Mar 25, 2016
Identified By: NRC
Item Type: NCV Non-Cited Violation
Failure to Verify the Tripping Characteristic of Molded Case Circuit Breakers (MCCBs) Used as Isolation Devices for the 120 Vac Instrument Power System. (Section 1R21.3b (1))
The inspectors identified a finding of very low safety significance and an associated NCV of Title 10 of the Code of Federal Regulations, Part 50, Appendix B, Criterion XI, "Test Control," for the licensee's failure to test the 120 Vac molded case circuit breakers (MCCBs) used as isolation devices on the instrument power system. Specifically, although the licensee had committed to test circuit breakers used as isolation devices in response to Final Safety Analysis Report Question 40.73 in 1982, there was no evidence that these MCCBs had ever been tested. The licensee subsequently entered the issue into its Corrective Action Program.

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 the safety-related instrument power system. Specifically, the licensee did not assure, by periodically verifying the time-current characteristic of the MCCBs, that the isolation devices would perform their safety function to isolate the nonsafety related instrument bus from the safety-related instrument power bus before the safety bus could be affected by a fault on the nonsafety related load. The inspectors determined that the finding was of very-low safety significance (Green) because it did not cause a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. The inspectors determined that there was no cross-cutting aspect associated with this finding because the finding was not indicative of the licensee's current performance. (Section 1R21.3.b(1))

Inspection Report# : 2016008 *(pdf)*

Significance: G Mar 25, 2016
Identified By: NRC
Item Type: NCV Non-Cited Violation
Failure to Verify Air Intake for Diesel Driven Auxiliary Feedwater Pump was Adequately Protected from a High Energy Line Break. (Section 1R21.3b (2))
The inspectors identified a finding of very low safety significance (Green) and an associated NCV of Title 10 of the Code of Federal Regulations, Part 50, Appendix B, Criterion III, "Design Control," for the failure to verify the adequacy of the diesel driven Auxiliary Feedwater (AFW) pump design. Specifically, the licensee failed to verify the diesel driven AFW pump could perform its safe shutdown function following a high energy line break (HELB) in the Turbine Building. Since the diesel's air intake was located in the Turbine Building, it would be impacted by a HELB. The licensee entered this issue into its Corrective Action Program and took immediate corrective actions by declaring the diesel driven AFW pump inoperable and then implementing a temporary plant modification to relocate the diesel air intake to the Auxiliary Building where it is not susceptible to a HELB to restore operability of the pump. The licensee's planned corrective actions are to complete a permanent plant modification to relocate the air intake to a location that is not susceptible to a HELB.

The performance deficiency was determined to be more than minor because it was associated with the Mitigating Systems cornerstone attribute of design control and adversely affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to verify that the diesel driven AFW pump could perform its safety function following a HELB event in the Turbine Building did not ensure its availability, reliability, and capability to respond to the initiating event. Since the finding did represent an actual loss of function of at least a single Train for greater than its Technical Specification Allowed Outage Time, a Detailed Risk Evaluation was performed which concluded that the estimated change in core damage frequency was approximately 3.4E-7/yr., which represents a finding of very-low

safety significance (Green). The inspectors did not identify a cross-cutting aspect associated with this finding because the finding was not indicative of the licensee's current performance. (Section 1R21.3.b(2))

Inspection Report# : 2016008 *(pdf)*

Significance: G Dec 31, 2015
Identified By: Self-Revealing
Item Type: NCV Non-Cited Violation
FAILURE TO ESTABLISH A WRITTEN PROCEDURE FOR A LOSS OF FEEDWATER EVENT IN MODE 3
A finding of very low safety significance and an associated NCV of Technical Specification 5.4.1, "Procedures," was self revealed on October 5, 2015, due to the licensee's failure to establish a written procedure for combating emergencies and other significant events, as required by Regulatory Guide 1.33, "Quality Assurance Program Requirements." Specifically, upon a loss of feedwater in Mode 3 (Hot Standby), which is an expected design and licensing basis event, the licensee did not have a written procedure as established by the Regulatory Guide. This issue was entered into the licensee's CAP as IRs 2566239 and 2565513. The inspectors determined the finding 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 Mitigating Systems cornerstone Procedural Quality attribute, and adversely impacted the objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the absence of a procedure(s) complicated the operator response to the loss of feedwater event in Mode 3. The inspectors determined the finding to be of very low safety significance in accordance with IMC 0609, Appendix A, "The SDP for Findings at Power," dated September 7, 2012, Exhibit 2, since the inspectors answered "No" to the Mitigating Systems questions under Section A, "Mitigating Systems, Structures, and Components and Functionality." The inspectors did not identify a cross cutting aspect associated with this finding, because it was confirmed not to be reflective of current performance due to the age of the performance deficiency.
Inspection Report# : 2015004 *(pdf)*

Significance: G Aug 28, 2015
Identified By: NRC
Item Type: NCV Non-Cited Violation
Failure to Ensure that Circuits Associated with Pressurizer PORVs and Block Valves Were Free of Fire Damage (Section 1R05.6.b)
Green. The inspectors identified a finding of very low safety significance, and an associated NCV of the Braidwood Station facility operating license condition 2.E associated with the Fire Protection Program for the licensee's failure to ensure that the safe shutdown capability was independent of the fire area and thus free of fire damage. Specifically, in the event of a fire in the control room, cable spreading rooms, or electrical cable penetration areas the circuits associated with the Pressurizer Power Operated Relief Valve (PORV) block valves, which are relied upon to safely shutdown the plant, could be affected and may not be available due to fire-induced failures. The licensee entered this issue into their Corrective Action Program, established fire watches, and intended to perform plant modifications to correct the issue.
The inspectors determined that the issue was more than minor because fire-induced circuit failures could impair the operation of the PORV block valves and complicate shutdown of the plant in the event of a fire in the control room, cable spreading rooms, or electrical cable penetration areas. The finding affected the Mitigating Systems Cornerstone. The finding was determined to be of very low safety significance based on a detailed risk-evaluation by a Region III Senior Reactor Analyst. This finding was not associated with a cross-cutting aspect because the finding was not representative of the licensee's current performance. (Section 1R05.6.b)

Inspection Report# : 2015007 *(pdf)*

Significance: G Jun 30, 2015
Identified By: NRC
Item Type: NCV Non-Cited Violation
MECHANIC JOINT LEAKAGE ACCEPTED FOR CONTINUED SERVICE WITHOUT CODE CORRECTIVE ACTIONS
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," for the licensee's failure to follow a procedure for completing an American Society of Mechanical Engineers (ASME) Section XI Code pressure test.
Specifically, the licensee failed to implement the required corrective actions or evaluations for evidence of leakage (boric acid deposits) identified on a containment spray (CS) system valve bolted connection prior to returning this component to service. The licensee entered this issue into their CAP and initiated actions to clarify procedures to ensure the ASME Code Section XI, Paragraph IWB-3522, requirements were implemented, and components with Code relevant conditions were corrected or evaluated prior to returning them to service. The performance deficiency was determined to be more than minor in accordance with IMC 0612, because if left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern. Specifically, the failure to adhere to procedure ER AA-330-001 was based upon the licensee's decision to return a component exhibiting evidence of boric acid leakage to service without Code corrective measures or evaluation. Additionally, this type of error could result in inservice failure of equipment. Therefore, this finding affected the Mitigating Systems Cornerstone attribute of Equipment Performance 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). The finding screened as having very low safety significance (Green), because the licensee's failure to adhere to procedure ER AA-330-001 and remove valve 1CS011B from service with a Code relevant condition did not result in operation of the plant with an inoperable system or component. Therefore, the inspectors answered "Yes" to Question A.1 of Exhibit 2, "Mitigating Systems Screening Questions," identified in Appendix A of IMC 0609, and the finding screened as having very low safety significance. The inspectors identified a cross-cutting aspect associated with this finding in the area of Human Performance, Conservative Bias because the licensee staff did not use a decision-making practice that emphasized prudent choices over those that were simply allowable. Specifically, the failure to remove valve 1CS011B from service with a relevant condition was based upon the licensee's decision that this was an allowable option because the ASME Code Section XI paragraph was not clear.

Inspection Report# : 2015002 *(pdf)*

Significance: G Jun 30, 2015
Identified By: Self-Revealing
Item Type: NCV Non-Cited Violation
CONTROL ROOM CHILLER INOPERABILITY DUE TO HIGH OIL CONTENT IN THE REFRIGERANT
A finding of very low safety significance and an associated NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was self-revealed on April 28, 2015, when licensee personnel failed to establish adequate procedural controls related to how much oil could be added or removed from the control room chillers without affecting its functionality. Specifically, the 0A control room ventilation (VC) chiller was declared inoperable due to high oil content in the refrigerant, which caused reduced cooling efficiency to the point of non-functionality. The licensee entered this issue in their CAP, restored the 0A VC chiller to operable status on May 1, 2015, and performed an evaluation to establish the acceptable level of oil migration to retain functionality of the VC chiller. The performance deficiency was determined to be more than minor in accordance with IMC 0612, because, it was associated with the Mitigating Systems Cornerstone attribute of Equipment Performance and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of mitigating systems to respond to initiating events to prevent undesirable consequences (i.e. core damage). The finding screened as having very low safety significance (Green), because it did not result in the loss of safety function, and did not result in an actual loss of function of at least a single train for greater than its technical specification allowed outage time. The inspectors

determined that the associated finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Resolution, because the licensee staff did not implement effective corrective actions to address issues in a timely manner commensurate with their safety significance. Specifically, following three documented issues with VC chiller performance, Engineering determined that the issues were related to high oil content in the chiller refrigerant. Based on this information, corrective actions related to optimizing refrigerant/oil levels in the chiller were recommended to the Plant Health Committee, which were approved for immediate implementation. However, the actions were not appropriately incorporated into the work control process or the CAP, which led to them not being implemented in a timely manner.
Inspection Report# : 2015002 *(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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