Braidwood 1
2Q/2006 Plant Inspection Findings

Initiating Events

Significance: G Jun 30, 2006
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Adequately Control Transient Combustibles
Failure to implement the licensee's procedure for control of combustible materials. Licensee personnel staged unattended transient combustible materials near vertical cable tray risers in the auxiliary building contary to the licensee's procedure for control of combustible materials which implemented a license condition requirement. This finding was related to the Work Control attribute of the cross-cutting area of Human Performance.
Inspection Report# : 2006009*(pdf)*

Mitigating Systems

Significance: G Jun 30, 2006
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Pre-Fire Plan
A finding for a violation of Braidwood's license condition 2.E for fire protection. The licensee failed to include information in the Braidwood's pre-fire plans to assist the fire brigade in being better prepared to fight a fire. Specifically, the licensee failed to include the presence of two compressed gas cylinders contained a mixture of hydrogen (22%) and nitrogen (78%) gases in their pre-fire plan for fire zone 11.5-0 (Unit 1 Auxiliary Building General Area - Elevation 401'-0").
Inspection Report# : 2006009*(pdf)*

Significance: G Jun 30, 2006
Identified By: NRC
Item Type: NCV NonCited Violation
FAILURE TO MAINTAIN FIRE BARRIER IN ACCORDANCE WITH FIRE PROTECTION PROGRAM
The inspectors identified a Non-Cited Violation of Braidwood Facility Operating License Nos. NPF-72 and NPF-77, Condition 2.E, for failing to maintain the firewall separating the fuel handling building and the auxiliary building in accordance with the approved fire protection program. Fire dampers were required to be provided in this firewall, except where an evaluation had been performed and approved to allow a deviation. Dampers were not installed in two ventilation ducts in the firewall separating the spent fuel pool heat exchanger rooms of the fuel handling building and the Unit 1 and Unit 2 containment pipe penetration areas of the auxiliary building; also, no evaluation or exemption existed to justify this configuration. The licensee entered the issue into its corrective action program for resolution, implemented compensatory measures that included hourly fire watches, and notified Byron Station. The condition was later confirmed to exist there as well. This finding was more than minor because it affected the Mitigating Systems Cornerstone objective to ensure that external factors (i.e., fire, flood, etc) do not impact the availability, reliability and capability of systems that respond to initiating events. The finding was of very low safety significance because the steel ventilation duct provided a minimum of 60 minutes fire endurance protection and the location of combustibles were positioned such that the unprotected duct penetration would not be subjected to direct flame impingement.
Inspection Report# : 2006003*(pdf)*

Significance: G Sep 30, 2005
Identified By: NRC
Item Type: NCV NonCited Violation
LACK OF A BOUNDING VOLTAGE DROP CALCULATION DURING AN SI
A finding of very low safety significance was identified by the inspectors associated with a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," where the licensee had no design basis calculation supporting adequate voltage levels for safety related equipment during a safety injection (SI). Voltage drop during an SI transient can be large and could result in operation of required safety-related equipment outside its design basis. After identification by the team, the licensee was able to demonstrate adequate voltage to support the operation of safety related equipment during this bounding voltage transient scenario. This finding was more than minor because if left uncorrected, the finding would become more significant. Modifications to the electrical distribution system can adversely affect the voltage for safety related equipment. Without a bounding voltage drop analysis to support the reliable operation of safety related equipment during an SI, these effects would go unnoticed causing adverse

conditions during an actual SI with off-site power available. This finding was of very low safety significance because it screened out using the Phase 1 worksheet.
Inspection Report# : 2005007*(pdf)*

Significance: G Sep 30, 2005
Identified By: NRC
Item Type: NCV NonCited Violation
EDG SX CROSS-CONNECT NOT SUPPORTED BY DESIGN BASIS
A finding of very low safety significance associated with a 10 CFR Part 50, Appendix B, Criterion III, "Design Control" was identified by the inspectors. The finding involved the operation of the emergency diesel generator jacket water coolers in a cross-connected configuration that was not supported by the plant's license and design basis. The licensee is evaluating the procedure for possible revision. This finding was more than minor because the licensee's established design and license basis for these coolers required a higher level of flow than that actually observed in the coolers during this cross-connected operation. The licensee had inappropriately relied on a manual operator action to justify operation in this configuration. This condition, if left uncorrected, would become more significant. This finding was of very low safety significance because it screened out using the Phase 1 worksheet.
Inspection Report# : 2005007*(pdf)*

Significance: G Sep 30, 2005
Identified By: NRC
Item Type: NCV NonCited Violation
FAILURE TO LEAK TEST BURIED SX INTAKE HEADER PIPING
The inspectors identified a finding involving a Non-Cited Violation (NCV) violation of 10 CFR Part 50.55a(g)4 having very low safety significance for failure to perform periodic leakage testing required by the American Society of Mechanical Engineers Code on the buried portions of the essential service water (SX) system intake piping. This finding was more than minor because failure to perform periodic leakage testing could have allowed undetected through-wall flaws to remain inservice. These undetected flaws could grow in size until leakage from the buried SX intake pipe degrades system operation or if sufficient general corrosion occurs, a gross rupture or collapse of the SX piping sections could occur. The finding was of very low safety significance because the licensee concluded that the piping systems were currently operable based upon pump surveillance testing which measured adequate SX system flow. The licensee also documented that piping failure was not anticipated due to the external pipe coating, cathodic protection and low system operating pressure.
Inspection Report# : 2005007*(pdf)*

Significance: G Sep 30, 2005
Identified By: NRC
Item Type: NCV NonCited Violation
NON-CONSERVATIVE CST INVENTORY CALCULATION
A finding of very low safety significance was identified by the inspectors associated with a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control" where the licensee failed to maintain an accurate design basis for the condensate storage tank (CST) useable inventory. The team identified an additional depletion path of CST water, the makeup valve (1(2)CD0035) from the CST to the condenser hotwell, that was not accounted for in the plant's calculation for useable CST volume. This finding was more than minor because it was associated with and affected the Mitigating Systems Cornerstone. Specifically, the capacity of the water source for the auxiliary feedwater (AFW) system was adversely affected by this additional depletion path. This finding was of very low safety significance because it screened out using the Phase 1 worksheet.
Inspection Report# : 2005007*(pdf)*

Significance: G Sep 30, 2005
Identified By: NRC
Item Type: FIN Finding
FAILURE TO PROVIDE PROCEDURE FOR RECOVERY OF POLUGGED SX STRAINER
The inspectors identified a finding of very low risk significance for failure to provide operators with equipment, procedures and training to manually operate the essential service water (SX) strainers to recover the loss of automatic backwash capability. Specifically, the loss of automatic strainer backwash function following a seismic event would lead to SX strainer plugging and without adequate recovery procedures, the loss of SX system flow. This finding did not constitute a violation of NRC requirements because the strainers (aside from the pressure boundary) and associated backwash equipment were not considered safety-related. The inspectors determined that this finding was of more than minor significance because it would become a more significant safety concern if left uncorrected. Specifically, the failure to provide equipment, procedures and training for manually backwashing the SX strainers could result in loss of cooling to safety-related equipment cooled by SX following a seismic event. An NRC Regional III Senior Reactor Analyst (SRA) performed a qualitative Phase 3 risk evaluation and determined that the initiating event frequency of a seismic event was low. In performing this evaluation, the SRA considered the lack of data to support how long it would take to plug the strainers with sediment or debris and given that strainer plugging may take days, there was a high likelihood that recovery of the backwash function would occur. Although there were no plant procedures, the licensee had access to vendor documents which provided adequate instructions for the manual backwash operation, and the loss of off-site power operating procedure included actions to restore power to the 480 volt motor control center which supplied power to the SX strainer backwash motors and isolation valves. Based on these facts, the SRA determined that the finding was of very low safety significance. The licensee entered this deficiency into their corrective action program for resolution.
Inspection Report# : 2005007*(pdf)*

Barrier Integrity

Significance: G Jun 30, 2006
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Take Effective Corrective Action
A finding of very low safety significance was identified by the inspectors associated with a violation of 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action.” Specifically, the licensee failed to identify and revise a Braidwood’s procedure to provide appropriate compensatory measures when opening the control room ventilation duct access panels. The inspectors determined that this issue also affected the cross-cutting area of Problem Identification and Resolution.

Inspection Report# : 2006009*(pdf)*

Significance: G Mar 31, 2006
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
LICENSED MAXIMUM POWER LEVEL EXCEEDED DUE TO FEEDWATER HEATER TRANSIENT
A finding of very low safety significance and associated Non-Cited Violation of Licensee Condition 2.C(1) “Maximum Power Level,” was self-revealed during the November 18, 2004, feedwater heater transient, which resulted in an increase of reactor power as high as 103.3 percent. Power was returned below the maximum licensed power by an automatic control rod stop and a turbine runback. This finding was considered more than minor because it had a credible impact on safety, in that exceeding the maximum allowed power level potentially challenged the integrity of the reactor coolant and fuel integrity barriers. This finding affected the Barrier Integrity Cornerstone and was considered to have a very low safety significance (Green). Specifically, using the SDP Phase 1 screening worksheet (IMC 0609, Appendix A, Attachment 1), the inspectors determined that the actual increase in reactor power did not significantly challenge either the reactor coolant or fuel integrity barriers.
Inspection Report# : 2006002*(pdf)*

Emergency Preparedness

Significance: SL-IV Dec 31, 2005
Identified By: NRC
Item Type: NCV NonCited Violation
DECREASING THE EFFECTIVENESS OF THE EMERGENCY PLAN BY CHANGING EAL RU2 THRESHOLD THAT ADDRESS RADIOLOGICAL EFFLUENTS W/O PRIOR NRC APPROVAL OR ADEQUATE 10 CFR 50.54(q) REVIEW
The inspectors identified that the licensee had changed its standard emergency action level (EAL) scheme by revising one EAL's criteria for an Unusual Event declaration that addressed an unplanned radiological release in excess of effluent radiation monitor readings unless the release could be determined to be below Offsite Dose Calculation Manual limits within 15 minutes for releases that could not be terminated in 60 minutes or less. The inspectors determined that this EAL change decreased the effectiveness of the emergency plan, and that the licensee did not obtain prior NRC approval for this change, contrary to the requirements of 10 CFR 50.54(q). The licensee is evaluating the options to correct the EAL.

This finding was more than minor because extending the time period required for the appropriate emergency classification of a radiological release could adversely affect the performance of both onsite and offsite emergency actions. Because the issue affected the NRC's ability to perform its regulatory function, it was evaluated with the traditional enforcement process as specified in Section IV.A.3 of the Enforcement Policy. According to Supplement VIII of the Enforcement Policy, this finding was determined to be a Severity Level IV because it involved a failure to meet a requirement not directly related to assessment and notification. Further, this problem was isolated to one EAL and was not indicative of a functional problem with the EAL scheme. Additionally, because the violation was a Severity Level IV and the licensee entered this issue into its corrective action program this finding is being treated as a Severity Level IV Non-Cited Violation of 10 CFR 50.54(q).
Inspection Report# : 2005010*(pdf)*

Occupational Radiation Safety

Public Radiation Safety

Significance: W May 25, 2006
Identified By: NRC
Item Type: VIO Violation
Braidwood Tritium WHITE finding - failure to survey
10 CFR 20.1501 requires that each licensee make or cause to be made surveys that may be necessary for the licensee to comply with the regulations in Part 20 and that are reasonable under the circumstances to evaluate the extent of radiation levels, concentrations or quantities of radioactive materials, and the potential radiological hazards that could be present. Pursuant to 10 CFR 20.1003, survey means an evaluation of the radiological conditions and potential hazards incident to the production, use, transfer, release, disposal, or presence of radioactive material or other sources of radiation.

10 CFR 20.1301 requires the licensee to conduct operations so that the total effective dose equivalent to individual members of the public from the licensed operation does not exceed 0.1 rem (1 mSv) in a year.

Between November 1996 and March 2005, the licensee did not make surveys to evaluate the potential hazards and to assure compliance with 10 CFR 20.1301, which limits radiation exposure to members of the public from licensed operations to 0.1 rem. Specifically, in November 1996, December 1998, and November 2000, failed vacuum breakers in the licensee's radioactive waste blowdown line resulted in large volumes of liquid contaminated with licensed material to leak in an uncontrolled manner to the unrestricted areas. Following the identified releases of radioactive material, the licensee failed to perform an adequate radiological survey to identify the extent of radiation levels, to evaluate the potential hazards associated with the radioactive material, and to ensure that the dose to the public did not exceed the levels specified in 10 CFR 20.1301. (AV 05000456, 457/2006008-01)

Technical Specification 6.8.4.e.5 requires that the licensee maintain and implement a program to determine the cumulative dose contributions from liquid effluents for the current calendar quarter and the current calendar year in accordance with the methodology and parameters in the Offsite Dose Calculation Manual (ODCM) at least once per 31 days.

Between November 1996 and March 2006, the licensee failed to determine the cumulative dose contributions from liquid effluents that inadvertently leaked into onsite and offsite groundwater (resulting from failed vacuum breakers along the circulating water blowdown line in 1996, 1998, and 2000) in accordance with the methodology and parameters in the ODCM within 31 days. Specifically, an estimated 250,000 gallon leak from Vacuum Breaker No.1 in November 1996 released water with radioactive material to the groundwater pathway; however, the licensee did not determine the dose from the release. In December 1998, an estimated 3 million gallon leak from Vacuum Breaker No. 3 released water with radioactive material to the groundwater pathway; however, the licensee did not determine the dose from the release. In November 2000, an estimated 3 million gallon leak from Vacuum Breaker No. 2 released water with radioactive material to the groundwater pathway; however, the licensee did not determine the dose from the release. (AV 05000456, 457/2006008-02)

Technical Specification 6.9.1.6 requires that the Annual Radiological Environmental Operating Report include summaries, interpretations, and analyses of trends of the results of the radiological environmental monitoring program for the reporting period and that the material shall be consistent with the objectives outlined in the Offsite Dose Calculation Manual (ODCM) and in 10 CFR Part 50, Appendix I, Sections IV.B.2, IV.B.3, and IV.C.

10 CFR Part 50, Appendix I, Section IV.B.2 states the licensee shall establish an appropriate surveillance and monitoring program to provide data on measurable levels of radiation and radioactive materials in the environment to evaluate the relationship between quantities of radioactive material released in effluents and resultant doses to individuals from principal pathways of exposure.

Between November 1996 and March 2006, the licensee did not establish an appropriate surveillance and monitoring program to evaluate the relationship between quantities of radioactive material released in effluents and resultant doses to individuals from principal pathways of exposure. Specifically, the unplanned radioactive material released in 1996, 1998, and 2000 from the circulating water blowdown line vacuum breakers constituted new principal pathways of exposure (i.e., the groundwater pathway) which the licensee had not adequately evaluated with the existing Radiological Effluent Monitoring Program (REMP). (AV 05000456, 457/2006008-03)

After considering the information developed during the inspection, the NRC has concluded that the inspection finding is appropriately characterized as White. The NRC also determined that the inspection finding involved three violations of NRC requirements, as cited in the attached Notice of Violation (Notice). The three violations involved your staff's failure to: 1) perform adequate radiological surveys, as required by 10 CFR 20.1501; 2) adequately implement a program to assess the cumulative dose contributions, as required by Technical Specification 6.8.4.e.5; and 3) conduct an adequate environmental monitoring program to provide data on measurable levels of radiation and radioactivity in the environment resulting from the releases, as required by Technical Specification 6.9.1.6. The circumstances surrounding the violations are described in detail within NRC Inspection Report 05000456/2006008; 05000457/2006008 (DRS). In accordance with the NRC Enforcement Policy, the Notice of Violation is considered an escalated enforcement action because it is associated with a White finding.
Inspection Report# : 2006008*(pdf)*
Inspection Report# : 2006012*(pdf)*

Significance: G May 25, 2006
Identified By: NRC
Item Type: NCV NonCited Violation
Braidwood Tritium WHITE finding - failure to maintain records (50.75g)
10 CFR 50.75(g) requires each licensee to keep records of information important to the safe and effective decommissioning of the facility in an identified location until the license is terminated by the Commission. The Commission considers information important to the decommissioning to

include records of spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site. These records may be limited to instances when significant contamination remains after any cleanup procedures or when there is reasonable likelihood that contaminants may have spread to inaccessible areas as in the case of possible seepage into porous materials such as concrete. These records must include any known information on identification of involved nuclides, quantities, forms, and concentrations.

As of March 6, 2006, the licensee did not keep records of spills or other unusual occurrences involving the spread of contamination in and around the facility for the 1996 or 1998 unplanned radioactive releases from the circulating water blowdown line vacuum breakers. Specifically, in November 1996, an estimated 250,000 gallon leak from Vacuum Breaker No. 1 released water with unknown quantities of radioactive material to the groundwater pathway that was not recorded. In December 1998, an estimated 3 million gallon leak from Vacuum Breaker No. 3 released water with unknown quantities of radioactive material to the groundwater pathway that was not recorded. (AV 05000456, 457/2006008-04).

The failure to maintain complete records of the spread of contamination from the vacuum breaker valve leaks was determined to be an inspection finding of low safety significance (Green). This inspection finding was also determined to be a violation of 10 CFR 50.75(g), which requires licensees to maintain records of information important to the safe and effective decommissioning of the facility.

Inspection Report# : 2006008*(pdf)*
Inspection Report# : 2006012*(pdf)*

Significance: SL-IV May 25, 2006
Identified By: NRC
Item Type: NCV NonCited Violation
Braidwood Tritium WHITE finding - failure to report
Technical Specification 6.9.1.7 requires that the Radioactive Effluent Release Report include a summary of the quantities of radioactive liquid and gaseous effluent and solid waste released from the facility during the prior year and that the material shall be consistent with the objectives outlined in the ODCM and in 10 CFR Part 50, Appendix I, Section IV.B.1.

The ODCM Section 12.6.2 requires, in part, that the Annual Radioactive Effluent Release Report include a list and description of unplanned releases from the site to areas beyond the site boundary of radioactive materials in gaseous and liquid effluents made during the reporting period.

As of March 6, 2006, the licensee failed to identify the occurrence of unplanned releases of radioactive liquid effluent that correspond to the vacuum breaker leaks to areas beyond the site boundary in the 1996 and 1998 Annual Radiological Environmental Operating Reports. Specifically, in November 1996, an estimated 250,000 gallon leak from Vacuum Breaker No. 1 released water with unknown quantities of radioactive material to the groundwater pathway that was not reported in the 1996 annual report. In December 1998, an estimated 3 million gallon leak from Vacuum Breaker No. 3 released water with unknown quantities of radioactive material to the groundwater pathway that was not reported in the 1998 annual report. (AV 05000456, 457/2006008-05)

The failure to fully report the leaks from the vacuum breaker valves in annual reports submitted to the NRC, as required by Technical Specifications, was determined to be a Severity Level IV violation of NRC requirements.

Inspection Report# : 2006008*(pdf)*
Inspection Report# : 2006012*(pdf)*

Physical Protection

Physical Protection information not publicly available.

Miscellaneous

Last modified : August 25, 2006