

Braidwood 2

1Q/2007 Plant Inspection Findings

Initiating Events

Significance:  Dec 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

TRANSIENT COMBUSTIBLES STAGED DIRECTLY BENEATH SAFETY RELATED HORIZONTAL CABLE TRAYS

The inspectors identified a non-cited violation of the Braidwood Station Operating License, having very low safety significance, for the failure to implement the licensee's procedure for control of combustible materials for 27 charcoal filter trays. Specifically, licensee personnel staged unattended transient combustible materials underneath horizontal cable trays in the auxiliary building in a manner contrary to the licensee's procedure for control of combustible materials. This finding has a cross-cutting aspect in the area of Human Performance because licensee work groups failed to communicate, coordinate, and cooperate with each other during activities in which interdepartmental coordination was necessary to assure plant and human performance. Corrective actions taken by the licensee included entering this issue into the station's corrective action program; relocating the charcoal filters to an authorized temporary storage location; and implementing extent of condition inspections in other areas of the auxiliary building. The finding was more than minor because the transient combustible materials presented a credible fire scenario involving equipment important to safety. The finding was of very low safety significance because the finding was assigned a low degradation rating due to the inability of the existing sources of heat or electrical energy to ignite the transient combustible materials.

Inspection Report# : [2006005](#) (*pdf*)

Significance:  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 contrary 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:  Mar 31, 2007

Identified By: NRC

Item Type: FIN Finding

DEGRADED QUALIFICATION OF ELECTRICAL PANELS DUE TO FAILURE TO SECURE DOORS

The inspectors identified a finding of very low safety-significance for failing to maintain the control panels for the control room ventilation system chillers and the auxiliary feedwater system, as well as numerous others, fully latched closed. As a result, the systems were in a degraded condition such that operability might have been impacted during a seismic or flooding event. The finding had a cross-cutting aspect in the area of Problem Identification and Resolution because supervisors and managers had failed to identify that standards for control of the qualification of electrical panels had degraded to the point that it had become the standard practice not to fully latch panels closed. The licensee failed to implement a low threshold for identifying issues in this aspect of its corrective action program. Corrective actions taken by the licensee included sending operators to walkdown the plant to secure all panel doors and write corrective action documents for all missing or degraded fastening hardware. Tailgate sessions were also held with all operations and

maintenance personnel to communicate the expectations for fastening panel doors. The finding was more than minor because it affected the reliability objective of the Mitigating Systems cornerstone for the external factors attribute. The finding was of very low safety significance because it was a qualification deficiency that did not result in loss of operability.

Inspection Report# : [2007003](#) (*pdf*)

Significance:  Jan 26, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Lack of 50.59 Evaluation for Substitution of Manual Actions for Automatic Start Signals on the A Motor Driven AFW Pump

Green. The inspectors identified a Severity Level IV NCV of 10 CFR 50.59(d)(1) for the licensee's failure to document an evaluation which provides a basis for the determination that the change, test, or experiment did not require a license amendment. Specifically, for Revision 4 and Revision 101 of procedure 1/2BwOA ELEC-4 "Loss of Off-site Power" the licensee failed to provide an evaluation as to why replacing an automatic pump start function with a manual action (e.g., placing the A motor driven auxiliary feed pump in "pull out") did not present more than a minimal increase in the likelihood of occurrence of a malfunction of a structure system or component important to safety previously evaluated in the Updated Final Safety Analysis Report. The licensee entered this issue into the corrective action program, and initiated actions to complete a 10 CFR 50.59 evaluation to determine if these procedure changes were acceptable without a license amendment. Because the licensee's procedure changes implemented the appropriate Technical Specification requirements, this issue did not affect the operability of the auxiliary feedwater system.

Because the issue potentially impacted the NRC's ability to perform its regulatory function, this finding was evaluated using the traditional enforcement process. The finding was determined to be more than minor because the inspectors could not reasonably determine that the procedural change, that affected the Updated Final Safety Analysis Report described design function of equipment important to safety, would not have ultimately required NRC prior approval. Based upon this Phase 1 screening, the inspectors concluded that the issue was of very low safety significance. (Section 1R02.1.b.2)

Inspection Report# : [2007002](#) (*pdf*)

Significance:  Sep 30, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO MAINTAIN ELECTRICALLY SUPERVISED FIRE DOORS IN ACCORDANCE WITH THE 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 electrical supervision for fire doors between the diesel generator rooms and their associated ventilation shaft rooms as required by the approved Fire Protection Report. The diesel generator rooms were protected by automatic total flooding gas suppression systems for which NRC fire protection regulations require electrical supervision or that a justification for an exception be given in the Fire Protection Report. The licensee had taken no exception for those doors. The licensee entered the issue into its corrective action program for resolution, and evaluated the condition as being acceptable in the interim due to frequent surveillance of the doors and the infrequency of their use. 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 issue only affected suppression, not detection or ignition, and a review of the history of the doors indicated that finding them open during the daily surveillances was extremely rare. In addition, failure of the gaseous suppression system to extinguish a diesel room fire due to one of the the doors being open, would not lead to the fire spreading to other areas except for the ventilation shaft, which was in the same fire zone.

Inspection Report# : [2006004](#) (*pdf*)

Significance:  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:  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*)

Barrier Integrity

Significance:  Jan 26, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Basis in 10 CFR 50.59 Evaluation for Installation of Sulfuric Acid System

Green. The inspectors identified a Severity Level IV NCV of 10 CFR 50.59 "Changes, Tests, and Experiments," having very low safety significance (Green) for the licensee's failure to perform an adequate safety evaluation review for changes made to the facility per modification EC 357102. In safety evaluation BWR-E-2006-196 (for EC 357102), the licensee failed to provide an adequate basis as to why the installation of two 15,000 gallon sulfuric acid tanks sharing a common drain system with a sodium hypochlorite tank did not create conditions for an accident of a different type than any previously evaluated in the Updated Final Safety Analysis Report. When these chemicals mix, they would produce an on-site release of chlorine gas, which could potentially overcome the control room operators. The licensee entered this issue into the corrective action program and considered the control room heating, ventilation and air conditioning system operable because of the time of year (mid-winter) such that weather conditions favoring formation of a tornado does not occur. Also, the licensee stated that the sulfuric acid tanks would be drained to approximately 2000 gallons each during the times of year when tornadoes are more likely to minimize the magnitude of any chlorine release.

Because the issue potentially impacted the NRC's ability to perform its regulatory function, this finding was evaluated using the traditional enforcement process. The finding was determined to be more than minor because the inspectors could not reasonably determine that the activity to install the new sulfuric acid tanks without detection and alarm circuits to notify the control room would not have ultimately required NRC prior approval. This finding has a cross-cutting aspect in the area of human performance because the licensee did not make appropriate or conservative decisions with respect to reviewing the plant design and license basis. Specifically, the licensee staff chose a narrow interpretation of Regulatory Guide 1.78 "Assumptions for Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release," such that a control room habitability evaluation for an on-site chlorine gas release was not completed. The finding was not suitable for a significance determination process evaluation, but has been reviewed by NRC Management in accordance with qualitative criteria of Appendix M of IMC 0609 and is determined to be a finding of

very low safety significance. (Section 1R02.1.b.1)

Inspection Report# : [2007002](#) (*pdf*)

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*)

Emergency Preparedness

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# : [2006012](#) (pdf)

Inspection Report# : [2006008](#) (pdf)

Inspection Report# : [2007008](#) (pdf)



Significance: 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# : [2006012](#) (*pdf*)

Inspection Report# : [2006008](#) (*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 : June 01, 2007