

## Braidwood 2

### 3Q/2006 Plant Inspection Findings

---

## Initiating Events

**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:**  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\(pdf\)](#)

**G****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\(pdf\)](#)**G****Significance:** Nov 09, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

**FAILURE TO PROVIDE REQUIRED FUNCTION TO FIRE SUPPRESSION SYSTEM IN 2A DOST ROOM**

The inspectors identified a finding of very low safety significance and associated non-cited violation of Braidwood Station Unit 2 Operating License NPF-77, Condition 2.E. This finding was related to the unavailability of the foam-water fire suppression system for the 2A diesel oil storage tank room due to a system blockage. The licensee cleared the blockage and revised applicable procedures to prevent future blockages. The primary cause of this finding was associated with the Problem Identification and Resolution cross-cutting area, in that the licensee failed to take timely corrective action resulting in the foam suppression system for the above room being inoperable for a 5 year period. This finding was considered 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 (Green) in accordance with Phase 2 of the Fire Protection Significance Determination Process because there was no realistic scenario by which a postulated fire could have affected more than just the support equipment to the affected emergency diesel generator. In addition, the inspectors verified that the redundant train of emergency AC power and associated safety-related structures, systems and components would remain free of fire damage and that safe shutdown capability could be achieved even with the total loss of one diesel oil storage tank room.

Inspection Report# : [2005008\(pdf\)](#)

---

## Barrier Integrity

**G****Significance:** 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

**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:** <sup>W</sup> 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:** 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# : [2006012\(pdf\)](#)

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

---

## Physical Protection

[Physical Protection](#) information not publicly available.

---

## Miscellaneous

Last modified : December 21, 2006