April 26, 2002

Mr. John L. Skolds, President
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: BRAIDWOOD STATION, UNITS 1 AND 2
NRC INSPECTION REPORT 50-456/02-05(DRP); 50-457/02-05(DRP)

Dear Mr. Skolds:

On March 31, 2002, the NRC completed an inspection at your Braidwood Station, Units 1 and 2. The enclosed report documents the inspection findings which were discussed on April 2, 2002, with Mr. K Schwartz and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and to compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel. Specifically, this inspection focused on resident inspection and radiation protection activities.

Based on the results of this inspection, the inspectors identified three findings of very low safety significance (Green). These included failure to implement adequate corrective actions for incorrect instantaneous current trip setpoints for valve breakers, failure to follow a surveillance test procedure, and inadequate test controls to prevent pre-conditioning of equipment. All of the issues were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they were entered into your corrective action program, the NRC is treating the issues as Non-Cited Violations, in accordance with Section V1.A.1 of the NRC's Enforcement Policy.

If you contest a Non-Cited Violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, Region III, Resident Inspectors and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

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Sincerely,

/RA/

Ann Marie Stone, Chief
Branch 3
Division of Reactor Projects

Docket Nos. 50-456; 50-457
License Nos. NPF-72; NPF-77

Enclosure: Inspection Report 50-456/02-05(DRP);
50-457/02-05(DRP)

cc w/encl: Site Vice President - Braidwood
Braidwood Station Plant Manager
Regulatory Assurance Manager - Braidwood
Chief Operating Officer
Senior Vice President - Nuclear Services
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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50-456; 50-457
License Nos:	NPF-72; NPF-77
Report Nos:	50-456/02-05(DRP); 50-457/02-05(DRP)
Licensee:	Exelon Generation Company, LLC
Facility:	Braidwood Station, Units 1 and 2
Location:	35100 S. Route 53 Suite 84 Braceville, IL 60407-9617
Dates:	February 19 through March 31, 2002
Inspectors:	B. Dickson, Acting Senior Resident Inspector N. Shah, Resident Inspector D. Nelson, Radiation Specialist J. Roman, Illinois Department of Nuclear Safety
Approved by:	Ann Marie Stone, Chief Branch 3 Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000456-02-05(DRP), 05000457-02-05(DRP); on 02/19-03/31/02, Exelon Generation Company, LLC; Braidwood Station; Units 1 & 2. Post Maintenance Testing, and Surveillance Testing.

The report covered a 6-week period of resident inspection and an announced inspection by a regional radiation specialist. The inspection identified three Green findings. All of the findings involved Non-Cited Violations. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609 "Significance Determination Process" (SDP). The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at http://www.nrc.gov/NRR/OVERSIGHT/index.html.

A. Inspector Identified Findings

Cornerstone: Initiating Events and Mitigating Systems

- Green. The licensee failed to incorporate the correct instantaneous current trip setpoint following maintenance and replacement of a safety-related, motor operated valve's molded case circuit breaker. This issue was originally identified during the replacement of a similar molded case circuit breaker in September 2001. The inspectors identified a Non-Cited Violation for inadequate corrective actions.

  This finding was of very low safety significance because the issue did not represent an actual loss of a safety function of the reactor containment fan coolers. (Section 1R19)

- Green. The inspectors identified a Non-Cited Violation for an operator failing to follow surveillance test procedures during the performance of Unit 2 auxiliary feedwater system slave-relay testing.

  This finding was of very low safety significance because the issue affected only one train of a safety-related system for less than the technical specification allowed outage time. (Section 1R22)

- Green. The inspectors identified a Non-Cited Violation for inadequate test controls during a monthly surveillance testing of the 1B auxiliary feedwater system monthly surveillance test.

  This finding was of very low safety significance because the inspectors determined that this preconditioning issue had not led to an actual decline in performance of the 1B auxiliary feedwater system. (Section 1R22)

Report Details

Summary of Plant Status

Both units operated at full power throughout the inspection period.

1. REACTOR SAFETY

Cornerstone: Initiating Events and Mitigating Systems

1R04 Equipment Alignment (71111-04)

a. Inspection Scope

The inspectors verified the alignment of the following systems while the alternate trains were out-of-service for planned maintenance:

- 1A auxiliary feedwater (AF) pump; and
- 2A safety injection pump.

The inspectors performed a partial walkdown of the accessible portions of these systems and observed the system (electrical and mechanical) lineup and selected system operating parameters (i.e., pump and bearing lube oil levels, room temperature, and electrical breaker position). The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), Technical Specifications, system drawings, condition reports (CRs) and station procedures, as applicable. As necessary, the inspectors also interviewed licensee engineering, maintenance and operations staff.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111-05)

a. Inspection Scope

The inspectors evaluated the licensees fire protection controls for the following areas:

- 1B/2B essential service water (SX) pump room;
- 1B AF pump room; and
- General areas of the 426' elevation of the turbine building.

The inspectors performed a walkdown of these areas to observe conditions related to the control of transient combustibles and ignition sources; the material condition, operational lineup and operational effectiveness of fire protection systems, equipment and features; and the material condition and operational status of fire barriers. The inspectors observed that the area (including associated fire protection and mitigation

equipment) was as described in the Braidwood Fire Protection Plan, dated December 1988.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111-06)

a. Inspection Scope

The inspectors evaluated the licensee's controls for mitigating external and internal flooding. Specifically, the inspectors performed the following:

- Reviewed the licensee's design basis documents to identify the design basis for flood protection and to identify those areas susceptible to external or internal flooding;
- Reviewed the licensee's probabilistic risk assessment results for external and internal flooding. Based on the assessment results, the inspectors also reviewed selected maintenance records for the fire protection system, as it was considered a significant flooding source;
- Reviewed selected abnormal operating procedures for identifying and mitigating flooding events;
- Reviewed selected maintenance records and surveillances for watertight doors and flood seals. The inspectors also observed the licensee's performance of the triennial flood seal inspection; and
- Observed the licensee's flood protection contingency actions during the removal of one of the SX room flood seals for routine work on March 21, 2002.

The inspectors also reviewed selected shift control room log entries and CRs to determine whether identified problems were being properly addressed via the licensee's corrective actions program.

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation (71111-12)

a. Inspection Scope

The inspectors reviewed the licensee's implementation of the maintenance rule, 10 CFR 50.65, as it pertained to identified performance problems with the following system:

- containment spray.

The inspectors evaluated the licensee's monitoring and trending of performance data and the appropriateness of a(1) goals and corrective actions. Specifically, the inspectors determined whether performance criteria were established commensurate with safety and whether equipment problems were appropriately evaluated in accordance with the maintenance rule. The inspectors interviewed the stations maintenance rule coordinator and reviewed selective CRs to determine whether identified problems were being entered into the corrective action program with the appropriate characterization and significance.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments And Emergent Work Control (71111-13)

a. Inspection Scope

The inspectors reviewed the licensee's assessment and management of plant risk for planned maintenance and/or surveillance activities on the following systems:

- 2B SX pump;
- 1B AF pump; and
- 2A containment spray pump

The 1B AF pump work was an emergent risk activity due to the pump failing to start during a routine licensee surveillance. Specifically, the inspectors reviewed both the licensee's management of plant risk (as described below), but also the licensee's troubleshooting efforts to identify the cause of the pump failure.

The inspectors attended shift briefings and daily status meetings to verify that the licensee took actions to maintain a heightened-level-of-awareness of the plant risk status among plant personnel. The inspectors also evaluated the availability of redundant train equipment. In particular, the inspectors observed whether licensee operating and engineering staff were aware of the licensee's revised probabilistic risk assessment model which was issued on June 28, 2000. The inspectors also reviewed Nuclear Station Procedure WC-AA-103, "On-Line Maintenance," Revision 3, and evaluated licensee compliance with that procedure.

In addition, the inspectors reviewed selected issues that the licensee entered into its corrective action program to verify that identified problems were being entered into the program with the appropriate characterization and significance.

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Nonroutine Plant Evolutions And Events (71111-14)

a. Inspection Scope

On February 25, 2002, the 1B AF pump failed to start during a routine surveillance. This resulted in the licensee making an unplanned entry into Technical Specification 3.7.5, which allowed a 72-hour period for troubleshooting the problem before having to commence a unit shutdown. Because of the inoperability of a safety-related mitigating system and the possibility of a unit shutdown, the inspectors observed the licensees overall management of plant risk during this period.

On March 28, 2002, the 2B emergency diesel generator tripped on underfrequency during a planned 24-hour surveillance run. This resulted in the licensee making an unplanned entry into Technical Specification 3.8.1, which allowed a 14 day period for troubleshooting the diesel before restoring it to operability. This Technical Specification also required that the licensee verify the operability of the 2A emergency diesel generator within 24-hours. Because of the inoperability of a safety related mitigating system, the inspectors observed the licensee's troubleshooting efforts to identify the failure cause and performed a walkdown of the 2A emergency diesel generator. The inspectors also observed the licensee's overall management of plant risk during this period.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111-15)

a. Inspection Scope

The inspectors reviewed and evaluated the following operability evaluations:

- 2A emergency diesel generator outside supply air dampers partially blocked by installed scaffolding (CR 91234);
- Inadequate instantaneous current strip setpoint of safety-related motor operated valves (see Section 1R19); and
- Seismic concerns with the replacement lube oil pump for the Unit 1B AF pp (CR 97834)

The inspectors also reviewed the technical adequacy of the evaluations against the Technical Specification, UFSAR, and other design information; determined whether compensatory measures, if needed, were taken; and determined whether the evaluations were consistent with the requirements of LS-AA-105, "Operability Determination Process," Revision 0.

In addition, the inspectors reviewed selected issues that the licensee entered into its corrective action program to verify that identified problems were being entered into the program with the appropriate characterization and significance.

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds (71111-16)

a. Inspection Scope

The inspectors reviewed the following documents during a semiannual cumulative review of operator work-arounds:

- Open operator workaround and operator list;
- Closed operator workaround report;
- Operator burden review Quarterly Report; and
- Nuclear station operator turnover checklists for Unit 1 and 2.

The inspectors evaluated the effects of the previously existing and new operator workarounds and operator challenges since the last semi-annual review. Inspectors toured plant areas, including the control room, to look for equipment that was degraded but not considered on the work-around list. Inspectors also reviewed CRs which referred to operator workarounds.

b. Observations and Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111-19)

a. Inspection Scope

The inspectors reviewed the post-maintenance testing associated with the following components:

- 2B SX pump; and
- 1B AF pump.

For each activity, the inspectors reviewed the applicable sections of the Technical Specification and UFSAR, and observed portions of the maintenance work. The inspectors also evaluated the adequacy of work controls (including foreign material exclusion controls), reviewed post-maintenance test data, and conducted walkdowns to verify system restoration after the testing was completed.

In addition, the inspectors reviewed selected issues that the licensee entered into its corrective action program to verify that identified problems were being entered into the program with the appropriate characterization and significance.

b. Findings

The inspectors identified (self-disclosing) a Non-Cited Violation of very low safety significance (Green) for inadequate corrective actions following a failed post-maintenance test for motor-operated valve 2SX016B.

On February 25, 2002, the operators attempted to stroke motor-operated valve 2SX016B, following the replacement of its associated molded case circuit breaker. This valve is the service water inlet valve for the 2B and 2D reactor containment fan coolers. The valve failed to stroke.

The licensee determined that the failure to stroke was due to the improper setting of the instantaneous current trip setpoint for the valve's breaker. This setpoint was designed to trip the breaker if the in-rush current immediately following valve operation was too high (i.e., locked rotor). The in-rush current varied proportionately with the voltage on the associated electrical bus powering the valve. The licensee identified that the instantaneous trip setpoint error band overlapped into the expected in-rush current range experienced when the valve operated normally. On the day of the surveillance, the bus voltage was on the higher end of the expected range; therefore, the breaker tripped. The post maintenance test used to verify the operability of the valve following maintenance did not require the licensee to stroke the valve under a particular bus voltage condition; therefore, it was fortuitous that this discrepancy was identified. Subsequently, the licensee corrected the 2SX016B setpoint and initiated CR 96945 to determine the corrective actions.

The inspectors noted that on September 10, 2001, the licensee experienced a similar problem (i.e., incorrect setpoint) with another, similar motor-operated valve. This issue was discussed in Section 1R15 of NRC Inspection Report 50-456/457-2001-010. After the September event, the licensee identified about 80 valves (including the 2SX016B) as having incorrect instantaneous current trip setpoints. However, no action was taken to correct these setpoints during preventative maintenance activities on the valve breakers. As a result, the 2SX016B valve breaker was replaced with a like-for-like breaker having the same, incorrect setpoint.

This finding was considered more than minor because if left uncorrected this issue could potentially affect a large number of valves. Specifically, as stated above, the stroke test could not verify whether the instantaneous trip setpoint was correct when the valve was returned to service. In this case, only the 2B and 2D reactor containment fan coolers were potentially affected. The fan coolers were safety-related and designed to protect the containment barrier. Since only the containment barrier cornerstone was affected, the inspectors performed a Phase I analysis of the event using the significance determination process (SDP). The inspectors answered "No" to all three containment barrier questions in the Phase I analysis, indicating that the issue was of very low safety significance.

10 CFR Part 50, Appendix B, Criterion XVI, states "that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly

identified and corrected." Contrary to the above, the licensee failed to use the correct instantaneous current trip setpoint for the 2SX016B valve, after identifying that the existing setpoint was incorrect. This is considered a violation. However, because this violation was of very low risk significance, was non-repetitive, and was captured in the licensee's corrective action program, it is considered a Non-Cited Violation consistent with Section VI.A.1 of the NRC Enforcement Policy (50-456/457/02-05-01(DRP)).

1R22 Surveillance Testing (71111-22)

a. Inspection Scope

The inspectors reviewed the following surveillance test activities:

- 2B AF pump slave relay testing;
- 2A solid state protection system bimonthly surveillance test;
- Unit 2 containment pressure accident monitoring loop calibration; and
- 1B AF pump monthly surveillance testing.

For each activity, the inspectors witnessed portions of the testing or reviewed the test data and determined if the associated structures, systems, and components met the American Society of Mechanical Engineers operating criteria, Technical Specification and UFSAR technical and design requirements. For selected activities, the inspectors also reviewed past test results to evaluate any adverse trends and to determine whether past testing was performed using consistent protocols.

In addition, the inspectors reviewed selected issues that the licensee had entered into its corrective action program to verify that identified problems were being entered into the program with the appropriate characterization and significance.

b. Findings

(1) Auxiliary Feedwater System Slave Relay Testing

The inspectors identified (self-disclosing event) a Non-Cited Violation of very low safety significance (Green), after a licensed nuclear operator mispositioned the control switch for the Unit 2 diesel driven AF pump during a routine surveillance.

On February 26, 2002, the operators performed 2BwOSR 3.3.2.7-632B, "Unit 2 Emergency Safeguards Features Actuation System Instrumentation Slave Relay Surveillance for Auxiliary Feedwater System Actuation Relays K632 and K639," Revision 0. This procedure required that the Unit 2 diesel driven AF pump control switch be placed in the "after trip" position. As stated above, an operator incorrectly placed the switch in the "pull-to-lock" position. This resulted in the pump being unable to auto-start in response to an engineered safeguards system actuation. In addition, this issue resulted in the operators being unaware of the configuration of the Unit 2 AF system for about 43 minutes. The licensee initiated CR 96800 to document this event and determine the corrective actions.

This finding was more than minor, as it had an actual impact on safety by affecting the availability of one train (i.e., the Unit 2 diesel driven AF pump) of a safety-related, mitigating system. Because this finding only affected the mitigating systems cornerstone, the inspectors performed a Phase I analysis of the event using the SDP. The inspectors answered "No" to all five questions in the Phase I analysis determining that the issue was of very low safety significance.

Technical Specification 5.4.1 states, in part, that written procedures shall be established implemented, and maintained covering the following activities: a. The applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Section 8(b)(1)(r) of this Regulatory Guide states, in part, that specific procedures for surveillance tests, inspections, and calibrations should be written for AF system tests. Contrary to the above, on February 26, 2001, an operator placed the control switch for the Unit 2 diesel driven AF pump in the "pull-to-lock" rather than the "after trip" position, as required by Step F1.3 of 2BwOSR 3.3.2.7-632B. This is considered a violation of Technical Specification 5.4.1. However, because this violation was of very low risk significance, was non-repetitive, and was captured in the licensee's corrective action program, it is considered a Non-Cited Violation consistent with Section VI.A.1 of the NRC Enforcement Policy (50-456/457/02-05-02(DRP)).

(2) Unit 1B AF System Monthly Testing Practices

On February 28, 2002, operators performed 1BwOSR 3.7.5.3-2, "Unit One Diesel Driven Auxiliary Feedwater Pump Monthly Surveillance." Prior to the start of the surveillance test, the inspectors walked down the Unit 1 diesel driven (1B) AF pump. During the walkdown, the inspectors noted that diesel components such as lubricating oil and jacket water piping, were warm-to-hot to the touch. The inspectors also noted that the diesel's engine casing was very warm, indicating a significant amount of internal engine heat. Prior to the start of the monthly surveillance test, the AF pump was started three times. The starts took place within a two-and-a-half hour time frame of when the monthly surveillance test was to be started and lasted from 12-16 minutes each. The diesel runs were part of the licensee's troubleshooting efforts from a system failure which occurred on February 25, 2002.

Shortly after noting the AF pump's physical condition, the inspectors observed operators in the 1B AF pump room gathering system data/indications as part of the pre-surveillance test checks. The inspectors questioned the operators regarding what system parameters were checked before the pump was started for the monthly surveillance test. Referencing the monthly surveillance test procedure, the operators stated that the system's alignment was checked and system parameters such as the diesel engines coolant level, pump suction pressure and battery charge were checked. Diesel engine parameters such as lubricating oil temperature and jacket water temperature were not considered as part of the pre-start check and hence, not part of the prerequisites to prevent preconditioning of the diesel prior to surveillance activities.

As part of its safety function, the auxiliary feedwater pumps were expected to automatically start and run from their normal standby condition in a response to a number of adverse plant conditions. Both NRC Information Notice 97-16,

"Preconditioning of Plant Structures, Systems, and Components Before American Society Mechanical Engineers Code In-Service-Testing or Technical Specification Surveillance Testing," and NRC Inspection Manual Chapter 9900 described certain unacceptable conditions of preconditioning. One of the unacceptable conditions mentioned included running major equipment prior to a surveillance test without adequate time to allow systems to settle to normal standby conditions. The inspectors found that the criteria used in the monthly surveillance test was not consistent with this preconditioning guidance. Additionally, several components such as fuel racks, relays, solenoid valves and other moving components were exercised and potentially lubricated prior to the start of the test. The inspectors reviewed 1Bw 5.5.8.AF.2 "Unit 1 Auxiliary Feedwater System Quarterly ASME Surveillance Test" and noted that preconditioning issue was addressed.

This issue was considered more than minor because if left uncorrected, preconditioning could result in an unrecognized degraded condition affecting the ability of the 1B AF pump to perform its required safety function. With respect to this specific example, the inspectors determined that this issue had not led to declining performance of the AF system. Therefore, this issue was considered to be of very low safety significance (Green).

Appendix B, Criterion XI, states in part, that test procedures shall include provisions for assuring that all prerequisites for a given test have been met. Failure to ensure that appropriate prerequisites were in place to prevent preconditioning of the diesel driven AF pump was a violation of Criterion XI. Because this violation was considered to be very low risk significance, non-repetitive, and was captured in the licensee's corrective action program (CR 100618), it was considered a Non-Cited Violation (50-456/457/02-05-03(DRP)).

(3) Diesel Driven AF Pump Monthly Surveillance Testing Frequency

On October 3, 1995, in response to NRC Generic Letter 93-05 "Line-Item Technical Specification Improvements to Reduce Surveillance Requirements for Testing During Power Operation," the licensee requested that the Technical Specification required surveillance testing frequency for the AF system be changed from 31 days to 92 days. The NRC granted this testing frequency change in Amendment 74.

During a review of the 1B AF pump's maintenance and surveillance test history, the inspectors noted that the licensee continued performing the surveillance test every 31 days despite the technical specification change. Additionally, during a review of the "Statement of Applicability" section of the monthly surveillance test procedure 1BwOSR 3.7.5.3-2, the inspectors noted the following statement: "This procedure SHALL be performed every 31 days, due to concerns with engine fuel pump prime."

This statement concerned the inspectors because 10 CFR Part 50.36 required the Technical Specifications to specify the lowest functional capability or performance level of equipment for the safe operation of the facility. Additionally, Section 10.4.9.5.1 of the UFSAR stated that "under emergency start conditions, prelubrication is not required for either the motor-driven or direct diesel engine-driven pumps to start. Automatic starting

without prelubrication can be accomplished without bearing damage (due to retention of an oil film on the bearing) provided that the pumps, or their auxiliary lube oil pumps, are started at least monthly."

The inspectors concluded that if the ability of the diesel-driven AF pumps to maintain a fuel prime was the limiting variable for how long the system can remain in its normal standby condition then this issue should be corrected or the licensee should change the technical specification testing frequency to represent the lowest functional capability. The inspectors also concluded that running the diesel driven AF system monthly to ensure that the system meets the 92-day technical specification requirement could be viewed as preconditioning.

The licensee documented the inspectors' concerns in CR 100618. In this CR, the licensee took an action item to evaluate whether a technical specification change was required for the diesel-driven AF pumps to allow continuation of the monthly testing frequency without being considered a preconditioning activity. Pending completion of the licensee evaluation, this issue is considered an Unresolved Item (50-456/457/02-05-04(DRP)).

1R23 Temporary Plant Modifications (71111-23)

a. Inspection Scope

The inspectors evaluated the licensee's installation of the following temporary modifications:

- Disabling of the high differential level pump trip for the 1B, 2A, and 2C circulating water pumps; and
- A temporary test procedure for isolating and draining the Unit 1 component cooling water heat exchanger.

The inspectors also reviewed selected issues that the licensee entered into its corrective action program to verify that identified problems were being entered into the program with the appropriate characterization and significance.

b. Findings

No findings of significance were identified.

2. OCCUPATIONAL RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121-01)

Plant Walkdowns and Radiological Boundary Verification

a. Inspection Scope

The inspectors conducted walkdowns of selected radiologically controlled areas within the plant to verify the adequacy of radiological boundaries and postings. Specifically, the inspectors walked down several radiologically significant work area boundaries (high and locked high radiation areas) in the auxiliary and radwaste buildings and performed confirmatory radiation measurements to verify if these areas and selected radiation areas were properly posted and controlled in accordance with 10 CFR Part 20, licensee procedures, and Technical Specifications. The inspectors also reviewed the radiological conditions within those work areas walked down, to assess the radiological housekeeping and contamination controls.

b. Findings

No findings of significance were identified.

2PS2 Radioactive Material Processing and Transportation (71122.02)

.1 Walkdown of Radioactive Waste Systems

a. Inspection Scope

The inspectors reviewed the liquid and solid radioactive waste system description in the UFSAR and the most recent information regarding the types and amounts of radioactive waste generated and disposed. The inspectors performed walkdowns of the liquid and solid radwaste processing systems to verify that the systems agreed with the descriptions in the UFSAR and the Process Control Program, and to assess the material condition and operability of the systems. The inspectors reviewed the current processes for transferring waste resins into shipping containers to determine if appropriate waste stream mixing and/or sampling procedures were utilized. The inspectors also reviewed the methodologies for waste concentration averaging to determine if representative samples of the waste product were provided for the purposes of waste classification in 10 CFR 61.55. During this inspection, the licensee did not conduct waste processing.

b. Findings

No findings of significance were identified.

.2 Waste Characterization and Classification

a. Inspection Scope

The inspectors reviewed the licensee's radiochemical sample analysis results for each of the licensee's waste streams, including dry active waste, resins, and filters. The inspectors also reviewed the licensee's use of scaling factors to quantify difficult-to-measure radionuclides (e.g., pure alpha or beta emitting radionuclides). The reviews were conducted to verify that the licensee's program assured compliance with 10 CFR 61.55 and 10 CFR 61.56, as required by Appendix G of 10 CFR Part 20. The inspectors also reviewed the licensee's waste characterization and classification program to ensure that the waste stream composition data accounted for changing operational parameters and thus remained valid between the annual sample analysis updates.

b. Findings

No findings of significance were identified.

.3 Shipment Preparation

a. Inspection Scope

The inspectors observed the preparation of a radioactive spent resin shipment. The inspectors observed the packaging, surveying, labeling, marking, placarding, vehicle checks, emergency instructions, disposal manifest, shipping papers provided to the driver, and the licensee's verification of shipment readiness for each shipment. The inspectors also observed the radiation worker practices of the workers preparing the package for shipment to verify that the workers had adequate skills to accomplish the task. The inspectors reviewed the records of training provided to personnel responsible for the conduct of radioactive waste processing and radioactive shipment preparation activities. The review was conducted to verify that the licensee's training program provided training consistent with NRC and Department of Transportation requirements.

b. Findings

No findings of significance were identified.

.4 Shipping Records

a. Inspection Scope

The inspectors reviewed five non-excepted package shipment documents completed in year 2001 and 2002, to verify compliance with NRC and Department of Transportation requirements (i.e., 10 CFR Parts 20 and 71 and 49 CFR Parts 172 and 173).

b. Findings

No findings of significance were identified.

.5 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed a 2002 focus area self-assessment of the Radioactive Material Shipping Program to evaluate the effectiveness of the self-assessment process to identify, characterize, and prioritize problems. The inspectors also reviewed corrective action documentation to verify that previous radioactive waste and radioactive materials shipping related issues were adequately addressed. The inspectors also selectively reviewed years 2001 and 2002 CRs that addressed access control and radioactive waste and radioactive materials shipping program deficiencies to verify that the licensee had effectively implemented the corrective action program.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

40A1 Performance Indicator Verification (71151)

a. Inspection Scope

The inspectors reviewed whether the licensee was accurately reporting data for the following performance indicators:

- Safety system unavailability for the emergency diesel generators; and
- Safety system unavailability for the residual heat removal system.

The inspectors reviewed system operating logs and licensee monthly operating reports submitted to the NRC, and interviewed licensee engineering and operations staff to determine whether the performance indicator data was being collected and reported consistent with the guidance contained in NEI 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 2.

b. Findings

No findings of significance were identified.

4OA6 Meetings

Exit Meeting

The inspectors presented the inspection results to Mr. K. Schwartz and other members of licensee management at the conclusion of the inspection on April 2, 2002. The

licensee acknowledged the findings presented. No proprietary information was identified.

Interim Exit Meeting

The results of the inspection were presented to Mr. Tom Joyce and other members of the licensee management at the conclusion of the inspection on March 5, 2002. The licensee acknowledged the findings presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

KEY POINTS OF CONTACT

Licensee

K. Schwartz, Plant Manager
T. Joyce, Assistant Plant Manager
J. Bailey, Regulatory Assurance - NRC Coordinator
G. Baker, Security Manager
R. Blaine, Radiation Protection Manager
T. Coughlin, Radiation Protection Field Superintendent
C. Dunn, Engineering Director
A. Ferko, Regulatory Assurance Manager
L. Guthrie, Maintenance Director
F. Lentine, Design Engineering Manager
C. Oshier, Radiation Protection Technical Supt

Nuclear Regulatory Commission

M. Chawla, Project Manager, NRR
A. Stone, Chief, Reactor Projects Branch 3

LIST OF ITEMS OPENED, AND CLOSED

Opened

50-456/457/02-05-01	NCV	failure to use the correct instantaneous current trip setpoint
50-456/457/02-05-02	NCV	failure to follow procedures
50-456/457/02-05-03	NCV	failure to include appropriate prerequisites in monthly surveillance
50-456/457/02-05-04	URI	diesel driven AF pump monthly surveillance testing frequency

Closed

50-456/457/02-05-01	NCV	failure to use the correct instantaneous current trip setpoint
50-456/457/02-05-02	NCV	failure to follow procedures
50-456/457/02-05-03	NCV	failure to include appropriate prerequisites in monthly surveillance

LIST OF ACRONYMS AND INITIALISMS USED

ADAMS	Agencywide Documents Access and Management System
AF	Auxiliary Feedwater
BwOSR	Braidwood Operability Surveillance Requirement
CFR	Code of Federal Regulations
CR	Condition Report
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulations
PARS	Publicly Available Records
SDP	Significant Determination Process
SX	Essential Service Water
UFSAR	Updated Final Safety Analysis Report
VIO	Violation

LIST OF DOCUMENTS REVIEWED

1R04 Equipment Alignment

BwOP AF-E1	Electrical Lineup - Unit 1 Operating	Revision 8
BwOP AF-M1	Operating Mechanical Lineup Unit 1	Revision 9
BwOP SI-1	Safety Injection System Startup	Revision 13
BwOP SI-2	Safety Injection System Shutdown	Revision 8
BwOP SI-M2	Operating Mechanical Lineup Unit 2	Revision 12
AR 00097914	Rework - Failed PMT 1B D/G JW Make Up	
AR 00098459	Packing and Gland Followers Lack Proper Thread Engagement	March 11, 2002
MA-AA-MM-6-00007	Torquing and Tightening of Bolted Connections	Revision 0

1R05 Fire Protection

Drawing BR-E-05A	CT Gypsum for Fire/Air Continuous Conduit End Seals	Revision 3
Drawing. BR-E-26	Ceramic blanket Fire/Air/Flood Seal for Capped or Plugged Conduit Sleeves	Revision A
TR-161	Transco Products Test Report Re: Fire and Hose Stream Tests of TCO-001 Cement. TCO-002 Medium Density Silicone, and TCO-007 Silicone Adhesive Used in Electrical Conduit and Blockout Penetrations	November 20, 1984
TR-207	Transco Products Test Report Re: Fire and Hose Stream Test of Empty Embedded Steel Sleeve and Plugs	September 12, 1985 Revision 1

1R06 Flood Protection Measures

AR 00076416	Degraded Flood Barrier in RCFC's	September 29, 2001
AR 00081432	Proposed DRP 9-049Needs Clarification	September 29, 2001

AR 00093970	Watertight Door Found Open with no Personnel in Room	February 5, 2002
CR A2001-01036	Degraded Watertight Doors	April 6, 2001
WO 970053418 01	Flood Seal Visual Inspection	November 2, 1998
WO 99269924	Fire Protection Valve Lubrication	February 10, 2002
WO –376141 01	Quarterly Inspection of Watertight Doors	January 22, 2002
	Review of Shift Operator Logs from January 01, 2001 to March 18, 2002 (Both Units)	
BwVS 220-1	Flood Seals Visual Inspection	Revision 1
DRP 9-049	Revisions of the Byron and Braidwood Flood Level Calculations	Revision 1

1R12 Maintenance Rule Implementation

	Expert Panel Meeting - Containment spray	November 13, 2000
AR00078929	Elevated particulate in 2CS01PA Lower Motor Bearing	September 28, 2001
AR 00091032	Concerns Raised During 1A CS Test	March 6, 2002
AR 00092363	1B CS Add Tank Flowrate Verification Out of Tolerance	February 4, 2002
CR A2001-01157	Work on 1CS009B Preventing Opening 1CS001B After Slave Relay Surv.	April 19, 2001
A2001-01198	1CS009B Limitorque Not Closing Properly in Manual Mode During Maintenance	April 18, 2001

1R13 Maintenance Risk Assessments And Emergency Work Control

Memo BR-023	Project summary 2/25/02 Work Window for 2AF01PB	Revision 3
1BwOL 3.7.5	LCOAR AF System Tech Spec LCO 3.7.5	Revision 2
BwAP 335-1T1	Shift Manager and Unit 1 Supervisor Operator Turnover Log Entries From February 26-27, 2002	Revision 6E1
AR 00098107	1A SX Cubicle Flow 1F1-SX037 Flow Indication Anomaly	

AR 00098265	2HD026C Positioned Failed, Bypass Switch Improperly Pinned	

1R15 Operability Evaluations

A 00091234	Unplanned LCOAR Entry for 2A Diesel Generator	January 18, 2002
LS-AA-105-1001 CR 97834	Evaluation of Seismic Capability of Replacement Motor for 2B Diesel-driven AF Pump Gearbox Lube Oil Pump Motor 2AF01PB-C-M	Revision 0
CR 89570	AF Diesel Shutdown Solenoid Inappropriate for Application	August 2002
CR 96945	MOV Feed Breaker Setting Issues	
CR 97834	Aux. Lube Oil Motor Weight Discrepancy	
WO 97122512 01	Replace Motor Aux FW Pump 2B Gear Box Lube Oil Pump	March 1, 2001

1R19 Post Maintenance Testing

AR 00096945	Potential Rework of 2SX016B Molded Case Breaker Replacement	February 25, 2002
WO 99222357 01	Trip Test MCC Breaker - MCC 232X4 Cub A1 2SX016B Molded Case Breaker RCFC 2B & 2D SX Inlet Valve	February 25, 2002
DCP/EC 335668	Change the Instantaneous Setting of the Circuit Breaker for 2SX016B	February 26, 2002
NEMA Stds Pub AB 4-1996	Guidelines for Inspection and Preventive Maintenance of Molded Case Circuit Breakers Used in Commercial and Industrial Applications	1996

1R22 Surveillance Testing

WO 98021782	1S-AF8002: Aux. FW Pump 1B Diesel Eng Speed, Tighten/RPLC G	October 20, 1998
WO 99093715	1AF01PB Failed to Start During Routine Surveillance	October 6,1999
WO 99220006 01	2P-PC004 CAL of Cnmt Press Channel A	March 11, 2002
WO 99220007 01	2P-PC005 Cal of Cnmt Press Electronic Cnmt Press channel B Power Supply	March 11, 2002

WO 00385490	1b AFP Failed to Start During Surveillance 1BwOSR	December 1, 2001
WO 00385722 01	U2 Train B Slave Relay Surv K632, 639	February 25, 2002
WO 00396391 01	Unit 2 SSPS, Reactor Trip Breaker, Reactor Trip B	March 4, 2002
AR 00096800	Configuration Control Event During Slave Relay Testing	February 26, 2002
BwAR 2-3-D4	Cnmt Press High	Revision 41E1
BwISR 3.3.3.2-206	Surveillance Calibration of containment Pressure Accident Monitoring Loop	Revision 1
1BwOSR 3.3.2.7-604B	Unit One ESFAS Instrumentation Slave Relay Surveillance (B Train Automatic Safety Injection - K604)	Revision 0E1
1BwOSR 3.3.2.7-632A	Unit One ESFAS Instrumentation Slave Relay Surveillance (Train A AF Actuation - K632, K639)	Revision 0
1BwOSR 3.3.2.7-643A	Unit One ESFAS Instrumentation Slave Relay Surveillance (Train A Automatic Containment Spray - K643)	Revision 0
2BwOSR 3.3.2.8-620B	Unit Two Slave Relay Surveillance (B Train - K620 and K633)	Revision 0
NED-I-EIC-0134	Containment Pressure Channel Error Analysis	Revision 0

1R23 Temporary Plant Modifications

EC 0000335828 001	Temporarily Defeat Traveling Screen High DP Trip for the 1B CW Pump	March 7, 2002
AR 00100335	U1 CC Heat Exchanger Setup for Draindown Test Not completed	March 25, 2002
AR 00101274	Local Valve Indication Plate for 1SX010 Missing for Excessive	March 21, 2002
0Bw0A ORU-8	Auxiliary Building flooding Unit 0	Revision
1WC-AA-101	On-Line Work Control Process	Revision 6
	Shift Manager Log - Shift 2	March 21,
2002SPP-02-003	Isolation and Drain of the Unit 1 component cooling Heat Exchanger (1CC01A)	Revision 0

2PS2 Radioactive Material Processing and Transportation

	Focus Area Self-Assessment Report Radiation Protection, Radioactive Material Shipping	February 15, 2002
RW-AA-100	Process Control Program for Radioactive Wastes	Revision 2
BwRP 5600-13	10 CFR 61 Waste Stream Sampling and Analysis	Revision 0
CC-AA-109	Abandoned Equipment Identification, Evaluation and Control	Revision 0
RP-AA-600	Radioactive Material/Waste Shipments	Revision 5
RP-AA-600-1001	Exclusive Use and Emergency Response Information	Revision 0
RP-AA-600-1005	Radioactive Material and Non Disposal Site Waste Shipments	Revision 0
RP-AA-601	Surveying Radioactive Waste Shipments	Revision 2
RP-AA-602	Packaging of Radioactive Material Shipments	Revision 5
Shipment RMS01-016	Rad Material, Y-II	March 9, 2001
Shipment RWS01-001	LSA II, Y-II, Filters	January 10, 2001
Shipment RWS01-031	LSA II, Y-III, Dewatered Resin	May 29, 2001
Shipment RWS01-032	LSA II, Y-III, Dewatered Resin	July 1, 2002
Shipment RWS02-001	LSA II, Y-III, Dewatered Resin	March 5, 2002
NSP-CC-3011	UFSAR/FPR Change Request Form, Radioactive Waste Systems	Revision 1
	Training Administrative System Course Completion Report, Transportation	February 2, 2002
BW010047	2000 Radioactive Effluent Release Report	April 25, 2000
BwRP 5600-13T7	Scaling Factor Determination Cover Sheet (Quarterly)	May 4, 2001
BwRP 5600-13T7	Scaling Factor Determination Cover Sheet (Annual)	July 24, 2001
CR A2001-01233	Inappropriate Radwaste Operations	April 26, 2001

CR A2001-01652	No Hard Copies of Radwaste Logs Being Kept	June 3, 2001
CR A2001-00068	Radiation Protection Surveys Not Completed	January 9, 2001
CR A2001-00480	Radioactive Waste Shipment Improperly Characterized	February 13, 2001
CR A2001-01035	Rad Shipment Planned Without Notifying Rad Protection	April 6, 2001
AR 00072465	NOS Identified Deficiency in RP Training Records	August 16, 2001

40A1 Performance Indicator Verification

	Braidwood Nuclear Power Plant system Performance Monitoring Plan	July 16, 2001
	Shift Manager Logs (Unit 1)	March 13, 2001
	Shift Manager Logs (Unit 2)	March 13, 2002
RS-AA-122-104	Performance Indicator SSV (HPSI, RHR, AFW/RCIC, EDG) March 1 - May 1, 2001	Revision 3
LS-AA-2040	Monthly PI Data Events for SSV - Emergency AC Power	June 25, 2001