

October 22, 2002

EA-02-118

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

SUBJECT: BRAIDWOOD STATION, UNITS 1 AND 2  
USNRC INTEGRATED INSPECTION REPORT 50-456/02-07; 50-457/02-07

Dear Mr. Skolds:

On September 30, 2002, the U.S. Nuclear Regulatory Commission (USNRC) completed an integrated inspection at your Braidwood Station, Units 1 and 2. The enclosed report documents the inspection findings which were discussed on October 1, 2002, with Mr. J. von Suskil 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.

Based on the results of this inspection, the USNRC has identified three issues that were evaluated under the risk significance determination process as having a very low safety significance (Green). The USNRC has also determined that a violation is associated with one of these issues. However, because of its very low safety significance and because the issue was entered into your corrective action program, the USNRC is treating the issue as Non-Cited Violations in accordance with Section VI.A.1 of the USNRC's Enforcement Policy. The NCV is described in the subject inspection report.

If you contest the subject or severity of the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission - Region III, Warrenville Road, Lisle, IL 60532-4351; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector at the Braidwood facility.

During the past year, in response to the terrorist attacks on September 11, 2001 the USNRC issued an Order and several threat advisories to commercial power reactors to strengthen licensees' capabilities and readiness to respond to a potential attack. The USNRC established a deadline of September 1, 2002 for licensees to complete modifications and process upgrades required by the Order. In order to confirm compliance with this Order, the USNRC issued Temporary Instruction 2515/148 and over the next year, the USNRC will inspect each licensee in accordance with this Temporary Instruction. The USNRC continues to monitor overall security controls and may issue additional temporary instructions or require additional inspections should conditions warrant.

In accordance with 10 CFR 2.790 of the USNRC's "Rules of Practice," a copy of this letter and its enclosure will be made available electronically for public inspection in the USNRC Public Document Room or from the Publicly Available Records (PARS) component of USNRC's document system (ADAMS). ADAMS is accessible from the USNRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

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 50-456/02-07;  
 50-457/02-07

See Attached Distribution

DOCUMENT NAME: C:\ORPCheckout\FileNET\ML022960210.wpd

To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	RIII	RIII	
NAME	SRay	AMStone	
DATE	10/22/02	10/22/02	

**OFFICIAL RECORD COPY**

cc w/encl: Site Vice President - Braidwood  
Braidwood Station Plant Manager  
Regulatory Assurance Manager - Braidwood  
Chief Operating Officer  
Senior Vice President - Nuclear Services  
Senior Vice President - Mid-West Regional  
Operating Group  
Vice President - Mid-West Operations Support  
Vice President - Licensing and Regulatory Affairs  
Director Licensing - Mid-West Regional  
Operating Group  
Manager Licensing - Braidwood and Byron  
Senior Counsel, Nuclear, Mid-West Regional  
Operating Group  
Document Control Desk - Licensing  
M. Aguilar, Assistant Attorney General  
Illinois Department of Nuclear Safety  
State Liaison Officer  
Chairman, Illinois Commerce Commission

cc w/encl: Site Vice President - Braidwood  
Braidwood Station Plant Manager  
Regulatory Assurance Manager - Braidwood  
Chief Operating Officer  
Senior Vice President - Nuclear Services  
Senior Vice President - Mid-West Regional  
Operating Group  
Vice President - Mid-West Operations Support  
Vice President - Licensing and Regulatory Affairs  
Director Licensing - Mid-West Regional  
Operating Group  
Manager Licensing - Braidwood and Byron  
Senior Counsel, Nuclear, Mid-West Regional  
Operating Group  
Document Control Desk - Licensing  
M. Aguilar, Assistant Attorney General  
Illinois Department of Nuclear Safety  
State Liaison Officer  
Chairman, Illinois Commerce Commission

ADAMS Distribution:

AJM  
DFT  
MLC  
RidsNrrDipmlipb  
GEG  
HBC  
SPR  
C. Ariano (hard copy)  
DRPIII  
DRSIII  
PLB1  
JRK1

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report Nos: 50-456/02-07; 50-457/02-07

Licensee: Exelon Generation Company, LLC

Facility: Braidwood Station, Units 1 and 2

Location: 35100 S. Route 53  
Suite 84  
Braceville, IL 60407-9617

Dates: July 1 through September 30, 2002

Inspectors: S. Ray, Senior Resident Inspector  
N. Shah, Resident Inspector  
C. Brown, Resident Inspector, Clinton  
D. Chyu, Reactor Inspector  
G. Hausman, Electrical Engineer  
D. Jones, Reactor Engineer  
T. Tongue, Project Engineer  
J. Roman, Illinois Department of Nuclear Safety

Approved by: Ann Marie Stone, Chief  
Branch 3  
Division of Reactor Projects

## SUMMARY OF FINDINGS

IR 05000456-02-07, 05000457-02-07; Exelon Generation Company, LLC; on 07/01-09/30/02, Braidwood Station; Units 1 & 2. Fire Protection, Maintenance Effectiveness, and Maintenance Risk Assessments and Emergent Work Control.

This report covers a 3-month period of baseline resident inspection and announced baseline inspections on inservice inspection activities. The inspection was conducted by Region III inspectors and the resident inspectors. Three Green findings, one of which was a Non-Cited Violation (NCV), were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be "Green" or be assigned a severity level after United States Nuclear Regulatory Commission (USNRC) management review. The USNRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

### A. Inspection Findings

#### **Cornerstone: Initiating Events**

Green. A finding of very low safety significance was identified through a self-revealing event when Unit 2 experienced rod control urgent failure alarms and a dropped control rod. The cause of the event was improperly installed insulation on three heat sinks in the rod control power cabinets which caused grounds and reduced voltages to the control rod stationary gripper coils. The heat sinks were not properly insulated from the cabinet chassis during a modification performed in the spring 2002 refueling outage. The primary cause of this finding was related to the cross-cutting area of Human Performance with inadequate work instructions as a contributing factor.

The finding was more than minor because it increased the likelihood of a reactor trip initiating event. The finding did not affect the ability to trip the reactor. Since the issue did not affect the likelihood of a loss of coolant, availability of mitigating systems, or the likelihood of a fire or flood, it was of very low safety significance. No violation of regulatory requirements occurred. (Section 1R13)

#### **Cornerstone: Mitigating Systems**

Green. A finding of very low safety significance was identified by the inspectors for a violation of Technical Specification Fire Protection Program requirements. The licensee removed two fire rated barriers (floor plugs) in the auxiliary building, and left them off for over five months, without establishing the required compensatory fire watches. The primary cause of this violation was related to the cross-cutting area of Human Performance. The licensee Fire Marshall failed to identify that the floor plugs were rated fire barriers, despite labels indicating that the 10 CFR 50, Appendix R, program applied to them, before authorizing their removal.

This issue was more than minor because a fire in one elevation of the auxiliary building could have spread to other elevations and therefore affected redundant trains of mitigating systems. The issue was of very low safety significance because the inspectors could not develop realistic fire scenarios in one elevation that could reasonably propagate to the elevations above. The issue was a Non-Cited Violation of Technical Specification 5.4.1 which required the implementation of written procedures covering the Fire Protection Program. (Section 1R05.1)

Green. A finding of very low safety significance was identified through a self-revealing event after the 2A diesel generator tripped during routine Technical Specification surveillance testing. The cause of the trip was an improperly installed thrust bearing wear detector during routine maintenance about a month before the trip. The primary cause of this finding was related to the cross-cutting area of Human Performance.

The issue was more than minor because the trip resulted in the unplanned unavailability of the generator in order to troubleshoot and repair the problem. The finding was of very low safety significance because the safety function of the 2A diesel generator was unaffected. No violation of regulatory requirements occurred. (Section 1R12).

**B. Licensee-Identified Violations**

No findings of significance were identified.

## REPORT DETAILS

### Summary of Plant Status

Unit 1 operated at or near full power throughout the inspection period except for one power reduction to about 85 percent on September 15, 2002, for turbine valve testing. Unit 2 operated at or near full power except for power reductions to about 80 percent, 87 percent, and 85 percent for load following on July 14, August 15, and September 23, 2002, respectively, and a power reduction to about 88 percent on August 11, 2002, for turbine valve testing. On August 27, 2002, Unit 2 was shutdown for rod control system troubleshooting and repairs. The unit was restarted on August 30, 2002.

### 1. REACTOR SAFETY

#### **Cornerstone: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness**

#### 1R04 Equipment Alignment (71111.04)

##### a. Inspection Scope

The inspectors performed partial walkdowns of accessible portions of trains of risk-significant mitigating systems equipment during times when the trains were of increased importance due to the redundant trains or other related equipment being unavailable. The inspectors utilized the valve and electric breaker checklists listed at the end of this report to verify that the components were properly positioned and that support systems were lined up as needed. The inspectors also examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors reviewed outstanding work orders (WOs) and condition reports (CRs) associated with the trains to verify that those documents did not reveal issues that could affect train function. The inspectors used the information in the appropriate sections of the Technical Specification (TS) and Updated Final Safety Analysis Report (UFSAR) to determine the functional requirements of the systems.

The inspectors verified the alignment of the following trains:

- the 2B diesel generator (DG), on July 8, 2002, while the 2A DG was unavailable due to maintenance;
- the fire protection system outside and auxiliary building ring headers, on July 16, 2002, while the station carbon dioxide fire suppression systems and the motor driven fire pump were unavailable due to maintenance; and
- the 1A auxiliary feedwater (AF) pump, on September 25, 2002, while the 1B AF pump was undergoing troubleshooting for a problem with its auxiliary lubricating oil pump.



b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 (Closed) Unresolved Item (URI) 50-456/457/02-06-01: Failure to Establish Compensatory Fire Watches for Two Removed Fire Rated Barriers

a. Inspection Scope

This issue was previously discussed in Inspection Report 50-456/457/02-06, Section 1R05.1. It involved the licensee's determination, in response to questions by the inspectors, that two large floor plugs had been removed in the auxiliary building for over five months without the required compensatory fire watches being established. During this inspection period the inspectors completed a determination of the safety significance of the issue. The inspectors conducting walkdowns of the fire areas involved, reviewed the locations of safety significant cables and components, and held discussions with licensee engineering personnel. The documents listed at the end of this report were also used by the inspectors to evaluate this area.

The inspectors reviewed the following documents as part of this inspection:

- CR 00112775, "Failure to Properly Identify Fire Barrier During Plant Barrier Impairment Review," June 21, 2002;
- CR 00115046, "Potentially Degraded Fire Brigade Effectiveness" June 20, 2002;
- Drawing 20E-0-3322D06, "Electrical Installation Auxiliary Building Partial Plan EI 383'-0," Revision BJ;
- Drawing 20E-0-3312, "Electrical Installation Auxiliary Building Plan EI 364'-0," Revision EA;
- Drawing 20E-0-3302, "Electrical Installation Auxiliary Building Plan EI 346'-0," Revision DK; and
- Drawing 20E-0-3322, "Electrical Installation Auxiliary Building Plan EI 383'-0," Revision DA.

b. Findings

During its review of questions by the inspectors, the licensee identified a Non-Cited Violation (NCV) of TS having very low safety significance (Green) for failing to establish required compensatory fire watches for two fire barriers that had been removed. This issue was considered to be USNRC-identified because the licensee had failed to identify it for over 5 months and did not identify it without the inspectors' questions.

As discussed in the above referenced report, the inspectors determined that failing to identify the removed fire barriers and establish the required compensatory fire watches was a performance deficiency warranting a significance evaluation. The inspectors concluded that the finding was greater than minor in accordance with Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Disposition Screening," dated April 29, 2002. The finding involved the attribute of

protection against external factors (fire) as well as human performance and could have affected the mitigating systems objective of ensuring the availability of systems that respond to initiating events to prevent undesirable consequences because a fire on one elevation of the auxiliary building could have spread to other elevations containing redundant equipment cables. The finding also affected the cross-cutting area of human performance because the licensee Fire Marshall failed to identify that the floor plugs were rated fire barriers, despite labels indicating that the plugs were part of the 10 CFR 50, Appendix R requirements, before authorizing their removal. On July 16, 2002, the inspectors completed a significance determination of this issue using IMC 0609, "Significance Determination Process (SDP)," dated April 30, 2002, Appendix F, "Determinating Potential Risk Significance of Fire Protection and Post-Fire Safe Shutdown Inspection Finding," dated February 2, 2001.

The inspectors reviewed the safe shutdown analysis for the three affected elevations (346, 364 and 383 foot elevations) in the auxiliary building. The floor plug openings were vertically aligned and toward the Unit 2 side. The Unit 1 related cables were of sufficient distance away from the opening; therefore, the inspectors reviewed only the Unit 2 and common equipment. The inspectors reviewed the equipment credited for post-fire safe shutdown operations to ensure that even if a fire were to propagate through the open floor plugs, there was redundant equipment available. The inspectors determined that the only system which could potentially lose redundancy was the AF system.

Since each elevation contained redundant safe shutdown trains and was justified by either additional fire protection features or engineering analysis (approved deviations), each elevation had its own unique method of achieving and maintaining safe shutdown conditions. The 3-hour rated floor plugs were not considered as 3-hour rated fire barrier separating redundant safe shutdown functions but as barriers separating fire area boundaries to limit fire propagation. Although not required, the inspectors entered the Phase 2 SDP evaluation as a matter of conservatism.

The inspectors toured these three elevations to determine realistic fire scenarios could be developed which could propagate fires through the floor plug openings. At the 346 foot elevation, minimal combustible materials were noted except a radiation protection storage cage near the floor plug opening. The licensee performed a fire modeling and determined that a damage temperature of 700 degrees Fahrenheit could be experienced at 8.4 feet above the floor. However, since the plume of hot gases would continue to be cooled due to loss of thermal energy as the smoke arose, the temperature at the 364 foot elevation would not be of sufficient magnitude to cause damage to other equipment on that elevation. Therefore, a realistic fire scenario could not be developed starting from 346 foot elevation to cause damage to equipment at 364 foot elevation.

The inspectors toured the 364 foot elevation to determine if a realistic fire scenario could be developed and propagate a fire to the 383 foot elevation. The system of concern which could potentially lose redundancy was the Unit 2 AF system. There was a transfer switch for the diesel-driven AF pump near the floor plug at the 364 foot elevation. The switch was installed to ensure the availability of the diesel-driven AF pump for several fire areas, including the 383 foot elevation where the motor-driven

AF pump was located in the open. The inspectors determined that a fire starting at the 364 foot elevation damaging the transfer switch, could not reasonably propagate to the 383 foot elevation to damage the motor-driven AF pump based on the following observations:

- there was low combustible loading near the floor plug at the 364 foot elevation;
- there was sprinkler coverage over the floor plug and over the component cooling water pumps (where the transfer switch is located) at 364 foot elevation;
- there was sprinkler coverage over the floor plug at 383 foot elevation; and
- the power cable for the motor-driven AF pump was at least 10 feet away from the floor plug opening with minimal intervening combustibles.

The inspectors could not develop realistic fire scenarios at the 346 and 364 foot elevations to propagate a fire or damaging hot gas layers to the elevations above, therefore, this finding screened out of Phase 2 of the fire protection SDP and was considered to be of very low safety significance (Green). The finding was assigned to the mitigating systems cornerstone for both units.

Technical Specification 5.4.1 required, in part, that written procedures shall be established, implemented, and maintained covering fire protection program implementation. One of the procedures established to meet this requirement was Braidwood Administrative Procedure BwAP 1110-1, Fire Protection Program System Requirements," Revision 15, which required, in Step E.7.a.3), with one or more required fire rated sealing devices unavailable, within 1 hour either establish a continuous firewatch on at least one side of the affected assembly, or verify the availability of fire detectors on at least one side of the unavailable assembly and establish an hourly firewatch patrol. However, on January 7, 2002, fire rated sealing devices (floor plugs) were removed from between the 346 and 364 foot elevations and from between the 364 and 383 foot elevations of the auxiliary building. The required firewatches were not established until June 21, 2002. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program, this violation is being treated as a NCV, consistent with Section VI.A of the USNRC Enforcement Policy. (NCV 50-456/456/02-07-01)

## .2 Other Fire Protection Walkdowns

### a. Inspection Scope

The inspectors conducted fire protection walkdowns which were focused on availability, accessibility, and the condition of fire fighting equipment, the control of transient combustibles and ignition sources, and on the condition and operating status of installed fire barriers. The inspectors selected fire areas for inspection based on their overall contribution to internal fire risk, as documented in the Individual Plant Examination of External Events with later additional insights, their potential to impact equipment which could initiate a plant transient, or their impact on the plant's ability to respond to a security event. The inspectors used the documents listed at the end of this report to verify that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and that fire doors, dampers, and

penetration seals appeared to be in satisfactory condition. The inspectors verified that minor issues identified during the inspection were entered into the licensee's corrective action program.

The following areas were inspected by walkdowns:

- the Division 21 miscellaneous electrical equipment and battery rooms on July 26, 2002;
- the auxiliary feedwater pump rooms on August 9, 2002;
- the turbine building 451 foot elevation fire doors on September 10, 2002;
- the turbine building 426 foot elevation fire doors on September 10, 2002;
- the turbine building 401 foot elevation fire doors on September 10, 2002;
- the auxiliary building 451 foot elevation fire doors on September 11, 2002;
- the auxiliary building 426 foot elevation fire doors on September 11, 2002; and
- the auxiliary building 401 foot elevation fire doors on September 11, 2002.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

- On July 24, 2002, the inspectors completed a review of the licensee's flood protection controls for the 1B/2B essential service water (SX) pump rooms. These rooms were chosen due to the SX system's importance as a support system for several mitigating systems. The evaluation consisted of a review of the UFSAR and other design documents identifying the design flood levels and boundaries for the rooms, a review of selected CRs and equipment work histories for equipment important to flood mitigation, and a walkdown of the pump rooms to verify that flood barriers were being properly maintained. Documents reviewed as part of this inspection are listed at the end of this report. The inspectors verified that minor issues identified during the inspection were entered into the licensee corrective action system. The inspectors also performed the following:
  - observed a licensee operator control room simulator exercise involving an SX flooding event in the auxiliary building on June 10, 2002; and
  - observed flood mitigation contingency actions during planned maintenance on the 1B/2B SX pump room watertight door on July 23, 2002.
- On September 17, 2002, the inspectors completed an inspection of the centrifugal charging pump room in the chemical and volume control (CV) system for both units to verify that internal flood protection measures discussed in the UFSAR and other documents listed at the end of this report were properly implemented. These rooms were chosen due to the charging system's importance in preventing reactor coolant pump seal failures in certain events.

Documents reviewed as part of this inspection are listed at the end of this report. The inspectors verified that minor issues identified during the inspection were entered into the licensee's corrective action system.

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection (ISI) Activities (71111.08)

a. Inspection Scope

During the week of August 26, 2002, the inspectors conducted a review of the licensee's ISI program for monitoring degradation of the reactor coolant system boundary and the risk significant piping system boundaries. Specifically, the inspectors conducted a record review of the following examinations:

<u>WELD #</u>	<u>CONFIGURATION</u>	<u>NDE TYPE</u>
2FW-03-05	Valve 2FW009B-Pipe	UT [ultrasonic test]
2FW-03-07	Pipe-Pipe	UT
2FW-03-19	Pipe-Elbow	UT
2SG-03-SGC-05	Lower Shell-Transition Cone	UT
2SG-03-SGC-06	Transition Cone-Upper Shell	UT
2RHP-01-RHP-02	Lug Attachments	PT [penetrant test]
2RHX-01-2RHXN1	Residual Heat Removal (RH) Heat Exchanger (HX) Shell-Nozzle	PT
2RHX-01-2RHXN2	Nozzle-RH HX Shell	PT

These examinations were evaluated for compliance with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code requirements. The inspectors also reviewed ISI procedures, equipment certifications, personnel certifications, and NIS-2 forms for Code repairs performed during the spring 2002 Unit 2 refueling outage to confirm that ASME Code requirements were met.

A sample of ISI related problems documented in the licensee's corrective action program, was also reviewed to assess conformance with 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requirements. In addition, the inspectors determined that operating experience was correctly assessed for applicability by the ISI group.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11)

a. Inspection Scope

On July 11, 2002, the inspectors observed an operating crew during an “out-of-the-box” requalification examination on the simulator using Scenario BR-15, “Respond to a Steam Generator Safety Valve Failure and Miscellaneous Malfunctions,” Revision 9. The inspectors evaluated crew performance in the areas of:

- clarity and formality of communications;
- ability to take timely actions in the safe direction;
- prioritization, interpretation, and verification of alarms;
- procedure use;
- control board manipulations;
- oversight and direction from supervisors; and
- group dynamics.

Crew performance in these areas was compared to licensee management expectations and guidelines as presented in the following Exelon procedures:

- OP-AA-101-111, “Rules and Responsibilities of On-Shift Personnel,” Revision 0;
- OP-AA-103-102, “Watchstanding Practices,” Revision 0;
- OP-AA-103-103, “Operation of Plant Equipment,” Revision 0;
- OP-AA-103-104, “Reactivity Management Controls,” Revision 0; and
- OP-AA-104-101, “Communications,” Revision 0.

The inspectors verified that the crew completed the critical tasks listed in the above simulator guide. The inspectors also compared simulator configurations with actual control board configurations. For any weaknesses identified, the inspectors observed the licensee evaluators to verify that they also noted the issues and discussed them in the critique at the end of the session.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors reviewed the licensee’s overall maintenance effectiveness of several safety-significant mitigating systems. This evaluation consisted of the following specific activities:

- observing the conduct of planned or emergent maintenance activities;
- reviewing selected CRs, open WOs, and control room log entries in order to identify system deficiencies; and
- a partial walkdown of the selected systems.

The inspectors also reviewed whether the licensee properly implemented the Maintenance Rule, 10 CFR 50.65, for those selected, structures, systems, or components (SSCs) having performance problems. Specifically, the inspectors determined whether:

- the SSC was scoped in accordance with 10 CFR 50.65;
- the performance problems constituted maintenance rule functional failures;
- the SSC had been assigned the proper safety significance classification;
- the system was properly classified as (a)(1) or (a)(2); and
- the appropriateness of the performance criteria for SSCs classified as (a)(2) or the appropriateness of goals and corrective actions for SSCs classified as (a)(1).

The above aspects were evaluated using the maintenance rule program and other documents listed at the end of this report. For each system, the inspectors also verified that the licensee was appropriately tracking reliability and/or unavailability.

The inspectors reviewed the following systems:

- the AF system including a planned surveillance on the 2A AF pump on August 8, 2002;
- the component cooling (CC) system including planned maintenance on the common CC pump on August 12, 2002; and
- the DGs including emergent maintenance on the 2A DG on August 14, 2002, and planned maintenance on the 2B DG on August 19, 2002.

b. Findings

A Green finding was identified for a self-revealing event after the 2A DG tripped during routine TS surveillance testing. The trip was caused by a maintenance error occurring during a prior work window. The finding was not considered a violation of regulatory requirements. However, the finding did result in unplanned unavailability for the 2A DG and an unexpected entry into the Limiting Conditions for Operations (LCO) Action Requirements of TS 3.8.1.

On August 14, 2002, the 2A DG experienced a turbocharger thrust bearing trip during the performance of a 24-hour endurance run surveillance test. The trip was caused by the improper installation of the thrust bearing wear detector during a July 2002 maintenance work window. This detector was normally installed with a 0.011 inch clearance between it and the maximum expected lateral thrust of the turbocharger assembly. In this case, the detector was installed without the necessary clearance, allowing it to contact the turbocharger during normal operation. The licensee confirmed this by direct inspection and verified that there was no actual wear of the turbocharger. The 2A DG was returned to service on August 15, 2002.

The bearing wear trip was a diesel generator protective trip that would be bypassed during emergency operation. Therefore, the 2A DG would have performed its safety function. However, in order to troubleshoot and repair the problem, the licensee had to take the engine out of service and it remained unavailable for about 25 hours.

The inspectors determined that the trip of the 2A DG due to improper maintenance was a performance deficiency. Therefore, the finding warranted a significance evaluation in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Disposition Screening," issued on April 29, 2002. This finding was considered more than minor as it involved the equipment performance attribute of the mitigating systems cornerstone, and affected the cornerstone objective of ensuring the availability of systems that respond to initiating events to prevent undesirable consequences. This finding also affected the cross-cutting area of human performance, because the trip was caused by the improper installation of the thrust bearing wear detector by a mechanic during routine maintenance.

Because the finding concerned the availability of one train of a mitigating system, the inspectors evaluated the finding using the guidance in IMC 0609, "Significance Determination Process (SDP)." Since the 2A DG was capable of performing its safety function, the inspectors answered "No" to all the questions for the Phase 1 screening under the Mitigating Systems column. The inspectors concluded that the finding was of very low safety significance (Green). The finding was assigned to the mitigating systems cornerstone of Unit 2. (FIN 50-457/02-07-02)

The improper installation of the wear detector was not considered a violation of regulatory requirements since the 2A diesel was capable of performing its safety function. The licensee entered the event into its corrective action system as CR 00119319, "Rework-2A diesel generator thrust bearing trip-unplanned LCO," dated August 14, 2002.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope

The inspectors reviewed the licensee's management of plant risk during emergent maintenance activities or during activities where more than one significant system or train was unavailable. The activities were chosen based on their potential impact on increasing the probability of an initiating event or impacting the operation of safety-significant equipment. The inspections were conducted to verify that evaluation, planning, control, and performance of the work were done in a manner to reduce the risk and minimize the duration where practical, and that contingency plans were in place where appropriate.

The licensee's daily configuration risk assessments records, observations of operator turnover and plan-of-the-day meetings, and the documents listed at the end of this report were used by the inspectors to verify that the equipment configurations had been properly listed, that protected equipment had been identified and was being controlled where appropriate, and that significant aspects of plant risk were being communicated to the necessary personnel. The inspectors verified that the licensee controlled emergent work in accordance with the expectations in the procedures listed at the end of this report.

In addition, the inspectors reviewed selected issues that the licensee entered into its corrective action program, including minor issues identified by the inspectors, to verify



that identified problems were being entered into the program with the appropriate characterization and significance.

The inspectors reviewed the following activities:

- troubleshooting, repair, and testing following a failure of solid state protection system (SSPS) relay K504 during a surveillance test on July 5, 2002;
- implementation of fire protection contingency actions during the planned unavailability of the plant carbon dioxide suppression systems and the motor driven fire pump on July 15, 2002;
- emergent repair of the 2A CV pump inboard seal during the planned unavailability of the 2C steam generator power operated relief valves (PORVs) and the 2B diesel driven AF pump on July 24, 2002;
- the unplanned unavailability of the 2A DG, the Unit 0 station air compressor, and the Unit 2 instrument air dryer during planned maintenance on the Unit 1 station air compressor, on August 14, 2002;
- the unplanned unavailability of the 1B SX pump due to emergent work on the associated pump strainer caused by severe weather on August 19, 2002; and
- rod control urgent failure alarms followed by a dropped control rod on Unit 2 on August 27, 2002.

b. Findings

A Green finding was identified through a self-revealing event affecting the control rod system where an improperly performed modification resulted control rod power supply problems which increased the likelihood of a reactor trip initiating event. The finding did not affect the ability to trip the reactor and was not considered to be a violation of regulatory requirements.

On August 27, 2002, Unit 2 experienced rod control urgent failure alarms on all five control rod power cabinets. This caused a lock-up of all control rods. Approximately two hours later, control rod K6 dropped fully into the core. During troubleshooting, the licensee identified that the rod control system had grounds and determined that the voltage supply to all stationary gripper coils was low enough to create the risk of dropping additional control rods. Therefore, on August 28, 2002, the licensee completed a forced shutdown of Unit 2 to prevent a possible reactor trip. Later investigations determined that the rod control power supply problems were caused by three improperly insulated electrical component heat sinks which caused grounds in the rod control power supplies.

The licensee determined that the heat sinks had been removed and reinstalled during the spring 2002 refueling outage as part of Design Change Package 9900560 to remove blocking diodes in the rod control system. The bodies of the heat sinks were normally insulated from the cabinet chassis by insulators both above and below the heat sink, isolating both the metal heat sink and its mounting bolts from the cabinet. The licensee found three heat sinks where the insulators were not properly installed, creating a current path from the heat sink to the chassis. The licensee entered the issue into its corrective action system as CR 00120745. The improper installation of the insulators was determined to be due to human performance errors on the part of the plant

electricians performing the work. A contributing cause was inadequate work instructions for installing the heat sinks, in that, installation details were not provided.

The inspectors determined that the rod control problems due to improper maintenance and an inadequate procedure was a performance deficiency. Therefore, the finding warranted a significance evaluation in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Disposition Screening," issued on April 29, 2002. This finding was considered more than minor because it was associated with the attribute of equipment performance of the rod control system and affected the initiating events cornerstone objective of limiting the likelihood of those events that upset plant stability during power operations. This finding also affected the cross-cutting area of human performance because the problem was primarily caused by improper maintenance during a modification.

Because the finding involved an increase in the likelihood of a reactor trip initiating event due to dropped control rods, the inspectors evaluated the finding using the guidance in IMC 0609, "Significance Determination Process (SDP)." The finding did not affect the ability to trip the reactor. Since the finding did not affect the likelihood of a primary or secondary loss of coolant, did not affect a mitigating system, and did not affect the likelihood of a fire or flood, the inspectors answered "No" to all the questions for the Phase 1 screening under the Initiating Events column. The inspectors concluded that the finding was of very low safety significance (Green). The finding was assigned to the initiating events cornerstone of Unit 2. (FIN 50-457/02-07-03)

Since the modification did not involve a procedure required to be implemented by Technical Specification 5.4, "Procedures," the improperly performed maintenance was not considered to be a violation of regulatory requirements.

#### 1R14 Personnel Performance Related to Non-routine Plant Evolutions and Events (71111.14)

##### a. Inspection Scope

As discussed in Section 1R13 of this report, on August 27, 2002, the Unit 2 control room operators received the following alarms within a one minute period: "Rod Control Non-Urgent Failure," "Rod Control Urgent Failure," and "Rod Drive M/G [motor/generator] Set Trouble." Per design, these alarms resulted in an automatic lockout holding the control rods in their current position and preventing further movement. In response, the control room operators implemented Braidwood Abnormal Operating Procedure 2BwOA Rod-2, "Failure of Rods to Move—Unit 2," Revision 54A. About two hours later, control rod K6 (located in control bank C) unexpectedly dropped into the core. In response, the control room staff implemented 2BwOA Rod-3, "Dropped or Misaligned Rod," Revision 101. Between August 27 and 28, 2002, operators slowly reduced power to 72 percent, in order to maintain Unit 2 within the analyzed core power limits.

The inspectors observed the control room operators' response to the above events including the implementation of the abnormal operating procedures. The inspectors also observed the subsequent manning of the licensee's Outage Control Center, and

the licensee's control of overall plant risk and its initial efforts to troubleshoot the rod control issues.

On August 28, 2002, the licensee determined that a risk of dropping additional control rods existed and decided to shut Unit 2 down to address the rod control issues. Because of the rod control urgent failure, the shutdown was performed without the usual use of control rods until they were eventually manually tripped from low power. The inspectors attended the pre-job briefing for the non-routine shutdown, and observed the actual shutdown. The inspectors verified that turbine load and reactor coolant system (RCS) boron concentration were carefully controlled so that reactor coolant temperature remained in the normal band throughout the shutdown. The inspectors also verified that core thermal limits and neutron flux profiles were being closely monitored and controlled. The inspectors reviewed the following procedures used by the operators during the shutdown:

- Reactivity Maneuver Form, "Ramp to Shutdown From 72 Percent With Inserted Rod K-6," August 28, 2002;
- Braidwood Operating Procedure 2BwOP 100-4, "Power Dissension," Revision 16; and
- 2BwOP 100-5, "Plant Shutdown and Cooldown," Revision 21.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors evaluated plant conditions and selected CRs for risk-significant components and systems in which operability issues were questioned. These conditions were evaluated to determine whether the operability of components was justified. The inspectors compared the operability and design criteria in the appropriate section of the TS and UFSAR to the licensee's evaluations presented in the CRs. The documents listed at the end of this report were also used to verify that the components or systems were operable.

The inspectors reviewed the following operability evaluations:

- CR 00115439, dated July 12, 2002, regarding the potential failure of the 1A motor driven AF pump oil cooler outlet valve to meet surveillance test criteria;
- an apparent cause evaluation for CR 00110320, dated July 18, 2002, regarding a problem with Fisher 67CFR air regulators to bleed off regulator outlet pressure;
- 2A emergency diesel generator turbocharger thrust bearing trip during surveillance testing on August 14, 2002; and
- high differential pressure on the 1B service water suction strainer on August 19, 2002.

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds (71111.16)

a. Inspection Scope

On September 20, 2002, the inspectors completed a semi-annual review of the cumulative effects of operator workarounds. Specifically, the inspectors reviewed the operator workarounds associated with the following CRs:

- CR 00121389, "2FW009A Hydraulic Pump Running Continuously," dated September 3, 2002;
- CR 00110964, "Response to Task Interface Agreement 2001-009," dated May 24, 2002; and
- CR 00090683, "Operator Work Around-2B RH Pump Seizure Procedure Issue," dated January 15, 2002.

The purpose of this inspection was to determine if the above workarounds had an adverse effect on the functional capability of a mitigating system or could potentially increase operator response time to manually initiate a mitigating system beyond the time assumed available in the design basis. The inspectors also discussed the workarounds with the licensee's PRA analyst to verify that any affected assumptions in the Probabilistic Risk Assessment remained valid. The inspection consisted of a review of records, direct observation of the workaround (as applicable) and interviews with licensee staff. The inspectors also reviewed the weekly Operator Work Around Status Update in the daily Plan of the Day for September 18, 2002.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the post maintenance testing activities associated with maintenance or modification of important mitigating, barrier integrity, and support systems to ensure that the testing adequately verified system operability and functional capability with consideration of the actual maintenance performed. The inspectors used the appropriate sections of the TS and UFSAR, as well as the documents listed at the end of this report, to evaluate the scope of the maintenance and to verify that the post maintenance testing was performed adequately, demonstrated that the maintenance was successful, and that operability was restored.

Testing subsequent to the following activities was observed and evaluated:

- planned maintenance on the motor-driven fire pump on July 20, 2002;
- repair of an oil leak on the 2B CV inboard bearing on August 1, 2002;
- emergent maintenance on the 2A DG on August 15, 2002;
- planned maintenance on the 2B DG on August 21, and 22, 2002;
- planned maintenance on the diesel-driven fire pump on August 25, 2002; and
- planned maintenance on the 1B diesel-driven AF pump on September 20, 2002.

b. Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope

Between August 28 and September 2, 2002, the licensee entered a forced shutdown of Unit 2 (A2F36) to address emergent issues with the rod control system and to recover from a dropped control rod. The specific details of these issues are discussed in Section 1R14 of this report. During the outage, the inspectors observed portions of the Unit 2 shutdown and startup (including reactivity control) and the licensee's troubleshooting efforts to recover the dropped rod and to resolve the rod control issues. The licensee remained in Mode 3 (hot standby) during this forced outage. The inspectors monitored shutdown activities to verify that risk considerations were factored into the licensee's outage plans, that decay heat removal and electrical power systems remained available to the maximum extend practical, and that reactivity was properly controlled. Documents reviewed during this inspection are listed at the end of this report.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

.1 (Closed) URI 50-456/457/02-05-04: Diesel-Driven AF Pump Monthly Surveillance Testing Frequency

a. Inspection Scope

This issue was previously discussed in Inspection Report 50-456/457/02-05, Section 1R22 b.(3). It involved the inspectors' identification that the TS allowed testing of the diesel-driven AF pumps on a 92-day frequency, in accordance with the Inservice Testing Program requirements of the ASME. However, the licensee was testing the pumps on a 31-day frequency with indications in the surveillance procedure and the UFSAR that monthly testing was necessary in order to maintain adequate lubrication and fuel priming for the diesel engine. This appeared to be contrary to 10 CFR 50.36, which required that the TS specify the lowest functional capability or performance level

of equipment. During this inspection period the inspectors reviewed the licensee's evaluation of the issue through discussions with licensee engineering management personnel and review of corrective action documentation.

b. Findings

A minor violation was identified in that TS surveillance requirements would not assure that the limiting conditions for operation of the AF system would be maintained.

On July 10, 2002, licensee engineering management personnel informed the inspectors that they had determined that the TS was, in fact, non-conservative and a test of the diesel-driven AF pumps should be conducted at least on a 31-day frequency to ensure operability and reliability of the prime mover (diesel engine) portion of the system. The licensee determined that the 92-day frequency was adequate to verify the performance of the attached pump in accordance with ASME requirements. The licensee was treating the issue in accordance with the guidance in USNRC Administrative Letter 98-10, "Dispositioning of Technical Specifications That Are Insufficient to Assure Plant Safety," dated December 29, 1988, and entered the issue into its corrective action system as CR 00115123, "AF TS Surveillance Requirements May Be Inadequate," dated July 10, 2002.

Since the licensee had never incorporated, and didn't intend to incorporate, the allowed 92-day frequency into its surveillance procedures and had continued to test the pumps on at least a 31-day frequency, there was no actual or credible impact on mitigating system reliability. The inspectors determined that the issue was minor in accordance with the screening criteria of IMC 0609, Appendix B, "Issue Dispositioning Screening," because they answered "No" to all of the questions in Section C, "Minor Questions."

The inspectors determined that the licensee was in violation of 10 CFR 50.36 (c)(3) because the surveillance requirements of TS 3.7.5, " AF System," would not assure that the limiting conditions for operation of the AF system would be maintained. However, the violation should be corrected and constitutes a violation of minor significance that is not subject to enforcement action in accordance with Section IV of the USNRC's Enforcement Policy.

.2 (Closed) Violation (VIO) 50-456/457/01-11-02: Failure to Maintain Adequate Test Control Program

a. Inspection Scope

This violation was previously discussed in Inspection Report 50-456/456/01-09, Section 1R22, and 50-456/457/01-11, Section 1R22. The issue was also discussed in the letters listed at the end of this report. The inspectors reviewed procedures for operator shiftly channel checks listed at the end of this report to ensure that the appropriate changes were made to the ultimate heat sink operability verifications to account for instrument uncertainties.

b. Findings

No findings of significance were identified.

.3 Routine Surveillance Activity Inspections

a. Inspection Scope

The inspectors witnessed selected surveillance testing and/or reviewed test data to verify that the equipment tested using the surveillance procedures met the TS, the Technical Requirements Manual, the UFSAR, and licensee procedural requirements, and demonstrated that the equipment was capable of performing its intended safety functions. The activities were selected based on their importance in verifying mitigating systems capability and barrier integrity. The inspectors used the documents listed at the end of this report to verify that the testing met the frequency requirements; that the tests were conducted in accordance with the procedures, including establishing the proper plant conditions and prerequisites; that the test acceptance criteria were met; and that the results of the tests were properly reviewed and recorded.

The following tests were observed and evaluated:

- the quarterly loaded run on the security DG on July 2, 2002;
- the quarterly ASME run on the 1A safety injection (SI) pump on August 7, 2002;
- slave relay, ASME and valve stroke surveillance testing of the 1A containment spray pump on August 13, 2002; and
- once per 18 months testing of the bypass of automatic trips on the 2B DG on August 22, 2002.

On September 4, 2002, the inspectors completed a review of the licensee's overall surveillance program for monitoring boric acid corrosion. This review consisted of a review of selected surveillances, conducted per the licensee's responses to USNRC Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR [pressurized water reactor] Plants," and USNRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity." In particular, the inspectors reviewed whether the licensee had properly addressed self-identified examples of potential boric acid leakage.

The inspectors verified that minor issues identified during the inspection were entered into the licensee's corrective action program.

b. Findings

No findings of significance were identified.

## 1R23 Temporary Modifications (71111.23)

### a. Inspection Scope

On July 5 through 9, 2002, the inspectors reviewed a temporary maintenance alteration to install a freeze seal isolation on 2A DG SX return line 2SX26AA-10" [inch] so that valve 2SX052A could be replaced. This activity was chosen because a significant problem with the freeze installation could have resulted in a loss of SX to other risk-significant components. This was an installation in support of maintenance and was intended to be in place for less than 90 days, so a formal safety evaluation was not required.

The inspectors reviewed the WO for the job, including the engineering review for the installation, the engineering change to the original review to allow the work to be accomplished during plant operations, and the plant barrier impairment permits. The inspectors also walked down the piping where the freeze was to be installed before the work began, attended the high level awareness briefing, and observed a portion of the work. In addition, the inspectors also reviewed the operations contingency plan for potential failure of the freeze and attended shift turnover meetings where the contingencies were discussed. Finally the inspectors verified that the operations temporary change tracking log was used to record the temporary change as required.

The inspectors verified that problems identified by the licensee during the freeze installation were entered into the corrective action system.

The following documents were reviewed as part of this inspection:

- WO 99020152-02, "Install/Remove Freeze Seal to Isolate 2SX052A for Repair," June 21, 2002;
- Shift Memo, "2SX052A (2SX26AA-10") Freeze Contingencies," July 7, 2002;
- Temporary Change Tracking Log entries dated July 7, 2002;
- CR 00114753, "Freeze Jacket on the 2SX27DA Leaking From the Seams Around Pipe," July 8, 2002; and
- CR 00114776, "Unable to Perform Freeze Seal on 2SX27DA and 2SX26AA Lines," July 9, 2002.

### b. Findings

No findings of significance were identified.

## 1EP6 Drill Evaluation (71114.06)

### a. Inspection Scope

On August 7 and September 13, 2002, the inspectors observed emergency preparedness training drills from both the simulator control room and the technical support center. The inspectors verified that the drill plans identified the timing and location of expected classification, notification, and protective action recommendation opportunities and observed the conduct of the drills to verify that those opportunities had



been met or that the drill evaluators identified where they were not met. The inspectors also observed internal communications, USNRC notifications, emergency response data system activation, command and control transfers, and other aspects of drill performance to identify weaknesses and ensure that the licensee evaluators also noted the same weaknesses. The inspectors verified that deficiencies noted during the drills were entered into the licensee's corrective action program. Documents reviewed as part of this inspection are listed at the end of this report.

b. Findings

No findings of significance were identified.

**3. SAFEGUARDS**

**Cornerstone: Physical Protection**

3PP3 Response to Contingency Events (71130.03)

a. Inspection Scope

The Office of Homeland Security (OHS) developed a Homeland Security Advisory System (HSAS) to disseminate information regarding the risk of terrorist attacks. The HSAS implemented a five color-coded threat conditions with a description of corresponding actions at each level. NRC Regulatory Information Summary (RIS) 2002-12a, dated August 19, 2002, "NRC Threat Advisory and Protective Measures System," discusses the HSAS and provides additional information on protective measures to licensees.

On September 10, 2002, the NRC issued a Safeguards Advisory to reactor licensees to implement the protective measures described in RIS 2002-12a in response to the Federal government declaration of threat level "orange." Subsequently, on September 24, 2002, the OHS downgraded the national security threat condition to "yellow" and a corresponding reduction in the risk of a terrorist threat.

The inspectors interviewed licensee personnel and security staff, observed the conduct of security operations, and assessed licensee implementation of the threat level "orange" protective measures. Inspection results were communicated to the region and headquarters security staff for further evaluation.

b. Findings

No findings of significance were identified.

#### 4. OTHER ACTIVITIES

##### 40A1 Performance Indicator Verification (71151)

###### **Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**

##### .1 Unplanned Power Changes per 7,000 Critical Hours

###### a. Inspection Scope

On July 30, 2002, the inspectors reviewed the data submitted by the licensee for the Unplanned Power Changes per 7,000 Critical Hours performance indicator for both units for the period of July 1, 2001, through June 30, 2002. The inspectors reviewed computerized control room logs for selected days in the above period to ensure that any power changes meeting the criteria in Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 2, were reported. As part of this inspection the inspectors also reviewed CR 00109559, "2FW009A Hydraulic Pump Running Continuously - Unplanned Power Reduction," dated May 26, 2001.

###### b. Findings

No findings of significance were identified.

##### .2 Safety System Functional Failures

###### a. Inspection Scope

On July 30, 2002, the inspectors reviewed the data submitted by the licensee for the Safety System Functional Failure performance indicator for both units for the period of July 1, 2001, through June 30, 2002. The inspectors reviewed Licensee Event Reports (LERs) for the above period to ensure that any events meeting the criteria in Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 2, were reported. As part of this inspection, the inspectors reviewed NUREG 1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73," Revision 2, to verify that events had been properly classified and reported. A minor issue identified during this inspection is discussed in Section 40A3 of this report.

###### b. Findings

No findings of significance were identified.

##### .3 RCS Specific Activity

###### a. Inspection Scope

On September 5, 2002, the inspectors reviewed the data submitted by the licensee for the RCS Specific Activity performance indicator, for both units, for the period of October 21, 2001, through September 5, 2002. The purpose of the review was to

ensure that the licensee was appropriately reporting this indicator per the guidance in Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 2. Specifically, the inspectors reviewed computerized control room logs and chemistry sample results for selected days in the above period to ensure that the maximum value for dose equivalent iodine-131 reported by the licensee, remained at or below the applicable TS limit. Additionally, on September 6, 2002, the inspectors observed a chemistry technician obtain samples of Unit 1 and 2 reactor coolant in accordance with Braidwood Chemistry Procedure BwCP 613-9, "CVCS [charging and volume control system] Letdown Heat Exchanger Grab Sample," Revision 11, to verify that the samples were appropriately collected and analyzed.

b. Findings

No findings of significance were identified.

40A2 Identification and Resolution of Problems (71152)

.1 (Closed) URI 50-456/02-03-01: Apparent Violation of 10 CFR 50, Appendix B, Criterion XVI, for the Licensee's Failure to Identify the Cause and Take Action to Prevent Recurrence for Failures of Unit 1 Pressurizer PORV Accumulator Check Valves

(Open/Closed) VIO 50-456/02-03-01 (EA-02-118): Violation of 10 CFR 50, Appendix B, Criterion XVI, for the Licensee's Failure to Identify the Cause and Take Action to Prevent Recurrence for Failures of Unit 1 Pressurizer PORV Accumulator Check Valves

a. Inspection Scope

This issue was previously discussed in Inspection Report 50-456/457/02-03, Section 40A2 a, and was considered an URI. In addition, the licensee issued an LER which discussed the issue on June 17, 2002, and a revision to the LER on September 27, 2002. A minor issue with the LER is discussed in Section 40A3 of this report. In a letter to the licensee dated July 23, 2002, the USNRC stated that its final significance determination for the issue was that it was of low to moderate increased importance to safety, which may require additional USNRC inspections (White). A Notice of Violation was also issued with the letter. The licensee responded to the violation with a letter dated August 22, 2002, which described its assessment of the cause of the issue and its corrective actions. The inspectors also reviewed the licensee's response to the violation.

b. Findings

No findings of significance were identified.

## .2 Routine Review of Identification and Resolution of Problems

### a. Inspection Scope

As discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action system at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Minor issues entered into the licensee's corrective action system as a result of inspectors' observations are generally denoted in the report.

### b. Findings

No finding of significance were identified.

## .3 Selected Issue Follow-up Inspection

### Introduction

During the weeks of July 8, August 5, and September 23, 2002, the inspectors conducted a review of the licensee's evaluation and corrective actions associated with configuration control problems with particular emphasis on those believed to be caused by inadvertent bumping of valves or components. The licensee had previously identified that inadvertent bumping was one of the largest contributors to an adverse trend in configuration control over the last few years. The problems affected several cornerstones because configuration control problems could cause initiating events or make mitigating or barrier control systems unavailable. The focus of the inspection was to ensure that the licensee's conclusion that the components were bumped was reasonable, and that other possible causes of configuration problems were also considered. This was accomplished by a review of the associated CRs and plant walkdowns of the components, where practical. The inspectors also reviewed the timeliness and effectiveness of corrective actions taken for the events reviewed.

Configuration control problems associated with the following CRs were reviewed in detail:

- CR 00089605, "Containment Ventilation Isolation Signal Due To Inadvertent Bump of Control Switch," January 9, 2002;
- CR 00095256, "Unplanned Entry into Administrative Action Requirements of 2BwOS [Braidwood Operating Surveillance] PR-1a for Failure of 2PR08J," February 14, 2002;
- CR 00104616, "2CB025 Instrument Air Supply Valve (2IA1064) Found Isolated," April 20, 2002; and
- CR 00112369, "Unplanned 3.6.7 Limiting Condition for Operations Entry For 1CS010B Closure," June 18, 2002.

The following additional corrective action documents were reviewed, along with their associated Action Tracking Items:

- CR 00108783, "Procedure Adherence Identified as Common Cause For Configuration Control," May 17, 2002; and
- CR A2001-01588, "2SI080A Valve Found Out of Position During Rounds," June 5, 2001.

a. Effectiveness of Problem Identification

(1) Inspection Scope

The inspectors reviewed 23 potential configuration control events for the first three quarters of 2002. The inspectors assessed the licensee's threshold for documenting configuration control events, the types of events that were identified, and the circumstances which led to the discovery of the conditions. The inspectors also reviewed USNRC inspection reports for the period to determine whether any configuration control problems had been identified through inspections.

(2) Issues

The inspectors determined that the licensee was effective in identifying configuration control problems at a low threshold and entering them into its corrective action program. There was a good mix of problems identified through self-revealing events, equipment lineup checks, investigations of unexpected equipment operation (or failure to operate), and self-reported events. While most configuration problems were found by operators, as expected, several were discovered and reported by other groups. The effectiveness of the licensee in self-identifying configuration control issues was demonstrated by the fact that the USNRC identified no configuration control problems in 13 equipment alignment inspections conducted through the first three quarters of 2002. The inspectors concluded that the licensee was effective in identifying configuration control events.

b. Prioritization and Evaluation of Issues

(1) Inspection Scope

For the 23 potential configuration control events identified during the first three quarters of 2002, the inspectors reviewed the proximate root cause assessments with emphasis on those that the licensee believed were due to inadvertent bumping. Four of the events were classified as being caused by bumping. For those four, the inspectors evaluated the evidence which led the licensee to that conclusion, conducted walkdowns of the areas where appropriate, and assessed whether the licensee's conclusion was reasonable. The inspectors also reviewed the licensee's classification of each configuration control event for type and impact potential.

(2) Issues

For the four bumping events, one was immediately reported by an instrument mechanic who inadvertently repositioned a switch while removing tape from a lifted electrical lead. The other three were discovered when equipment failed to operate as expected or, in one case, when a main control board indication showed an unexpected condition. For one of the three, it was fairly evident that bumping of a limit switch mounting during moving of large equipment that had just been completed in the area was the cause. For the other two, it could not be determined with certainty that inadvertent bumping was the cause of the problem. However, both involved small ball valves that could be mispositioned by bumping the handles and both had scaffolding erected in the area. Bumping of valves handles while erecting or removing scaffolding had been a cause of several previous mispositioning events. The licensee's determination that the four configuration control events were all caused by inadvertent bumping appeared to be the most reasonable conclusion.

The licensee classified each configuration control event as either a status control or human performance event. They also classified each event as having low or high impact potential or causing an actual consequential event. The inspectors concluded that the licensee's prioritization and evaluation of configuration control events were reasonable.

c. Effectiveness of Corrective Actions

(1) Inspection Scope

The inspectors reviewed the licensee's corrective actions for configuration control events in general and inadvertent bumping events in particular. The inspectors also reviewed the rate of configuration control events for 2002 compared to previous years.

(2) Issues

Corrective actions for configuration control problems, in general, consisted primarily of procedure improvements, individual counseling, additional emphasis during pre-job briefings, and site-wide awareness enhancements. For the inadvertent bumping problems in particular, the primary corrective actions were individual counseling, removal, locking, or repositioning of valve handles, installation of pipe caps, and installation of protective covers on switches. For valves in which the licensee removed the handles, the inspectors verified that they were not valves which would be expected to require time-critical operation, that the handles were located next to the valves in a visible location, and that labels had been installed explaining that the handles were intentionally removed. The inspectors also verified that the licensee used reasonable criteria such as low impact of mispositioning and radiation dose to decide which valves not to take corrective action on.

The inspectors noted that configuration control was receiving a significant amount of attention, especially in most recent quarter of 2002. Recent events were discussed in every shift turnover meeting and each plan of the day meeting. Techniques for avoiding

configuration control problems were regularly discussed in pre-job briefings. Challenging goals were set for reducing the number of events. The inspectors noted that the rate of configuration control events significantly declined in 2002 compared to recent years. Of particular note, there was only one inadvertent bumping event from May 21 through September 27, 2002, with none in the third quarter of 2002. The inspectors concluded that the corrective action program for configuration control events was effective.

#### 4OA3 Event Follow-up (71153)

(Closed) Licensee Event Report (LER) 50-456/02-02-00: Failure of Pressurizer PORV Instrument Air Accumulator Isolation Check Valves to Isolate Caused by Improper Maintenance Activities

(Closed) Licensee Event Report (LER) 50-456/02-02-01: Failure of Pressurizer PORV Instrument Air Accumulator Isolation Check Valves to Isolate Caused by Improper Maintenance Activities

This LER and its revision describes the same issue that was closed in Section 4OA2.1 of this report. The inspectors reviewed the original LER and identified a minor issue related to failure of the licensee to classify the event as a safety system functional failure. The inspectors verified that the issue was entered into the licensee's corrective action system as CR 00120154, "Reclassification of Pressurizer PORV Instrument Air Accumulator Check Valve as a Safety System Functional Failure [USNRC-Identified]," dated August 12, 2002, and that the licensee issued a revised LER and also intended to correct the error in the next quarter's performance indicator submission.

The failure to initially properly classify the event was due to a misinterpretation of the reporting requirements of 10 CFR 50.73. This violation of the 10 CFR 50.73 reporting requirements did not impact the USNRC's ability to perform its regulatory function (because the event was reported under another category) and did not cause the Safety System Functional Failure performance indicator to exceed a threshold. Thus the issue was considered minor in accordance with IMC 1612, Appendix B, "Issue Disposition Screening," dated April 29, 2002. This violation was corrected and constitutes a violation of minor significance that is not subject to enforcement action in accordance with Section IV of the USNRC's Enforcement Policy.

#### 4OA4 Cross-Cutting Findings

- .1 A finding described in Section 1R05.1 of this report had, as its primary cause, a human performance deficiency in that the licensee Fire Marshall, despite labels indicating that 10 CFR 50, Appendix R requirements applied, failed to identify that floor plugs in the auxiliary building were rated fire barriers before authorizing their removal.
- .2 A finding described in Section 1R12 of this report had, as its primary cause, a human performance deficiency in that a thrust bearing wear detector had been improperly installed by a mechanic during a July 2002 work window, which caused the 2A diesel

generator to trip during TS surveillance testing. This event also resulted in additional, unplanned unavailability time for the 2A diesel generator.

- .3 A finding described in Section 1R13 of this report had, as its primary cause, a human performance deficiency in that plant electricians improperly installed heat sinks in the Unit 2 rod control cabinets during a modification in the spring 2002 refueling outage that resulted in a rod control urgent failure, a dropped control rod, and a forced shutdown.

#### 4OA6 Meetings

##### .1 Exit Meeting

The inspectors presented the inspection results to Mr. J. von Suskil and other members of licensee management at the conclusion of the inspection on October 1, 2002. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

##### .2 Interim Exit Meetings

The results of the Inservice Inspection Activities inspection were presented to J. von Suskil, and other members of licensee management at the conclusion of the inspection on August 22, 2002. The inspectors did not receive any information identified as proprietary during this inspection.



## KEY POINTS OF CONTACT

### Licensee

J. von Suskil, Site Vice President  
T. Joyce, Plant Manager  
G. Baker, Site Security Manager  
J. Bailey, Regulatory Assurance - USNRC Coordinator  
D. Chrzanowski, Inservice Inspection Coordinator  
G. Dudek, Operations Manager  
C. Dunn, Site Engineering Director  
A. Ferko, Regulatory Assurance Manager  
T. Green, Nondestructive Examination Level III Inspector  
M. Sears, Engineering Programs

### United States Nuclear Regulatory Commission

M. Chawla, Project Manager, Office of Nuclear Reactor Regulation  
A. Stone, Chief, Reactor Projects Branch 3

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened and Closed in This Report

50-456/02-03-01 EA-02-118	VIO	Violation of 10 CFR 50, Appendix B, Criterion XVI, for the Licensee's Failure to Identify the Cause and Take Action to Prevent Recurrence for Failures of Unit 1 Pressurizer PORV Accumulator Check Valves
50-456/456/02-07-01	NCV	Failure to Establish Compensatory Firewatches for Two Removed Fire Rated Barriers
50-457/02-07-02	FIN	Maintenance Error on 2A DG Results in Unplanned Unavailability of Mitigating System
50-457/02-07-03	FIN	Errors During Modification of Rod Control System Results in Increased Likelihood of Reactor Trip Initiating Event

### Closed

50-456/457/01-11-02	VIO	Failure to Maintain Adequate Test Control Program
50-456/02-02-00	LER	Failure of Pressurizer PORV Instrument Air Accumulator Isolation Check Valves to Isolate Caused by Improper Maintenance Activities
50-456/02-02-01	LER	Failure of Pressurizer PORV Instrument Air Accumulator Isolation Check Valves to Isolate Caused by Improper Maintenance Activities

50-456/02-03-01	URI	Apparent Violation of 10 CFR 50, Appendix B, Criterion XVI, for the Licensee's Failure to Identify the Cause and Take Action to Prevent Recurrence for Failures of Unit 1 Pressurizer PORV Accumulator Check Valves
50-456/457/02-05-04	URI	Diesel-Driven AF Pump Monthly Surveillance Testing Frequency
50-456/457/02-06-01	URI	Failure to Establish Compensatory Firewatches for Two Removed Fire Rated Barriers

Discussed

None.

## LIST OF ACRONYMS AND INITIALISMS USED

AC	Alternating Current
ADAMS	Agencywide Documents Access and Management System
AF	Auxiliary Feedwater
ASME	American Society of Mechanical Engineers
BwAP	Braidwood Administrative Procedure
BwCP	Braidwood Chemistry Procedure
BwMP	Braidwood Maintenance Procedure
BwOA	Braidwood Abnormal Operating Procedure
BwOL	Braidwood Operating Limiting Condition for Operations Action Requirement
BwOP	Braidwood Operating Procedure
BwOS	Braidwood Operating Surveillance
BwOSR	Braidwood Operating Surveillance Requirement
BwVP	Braidwood Engineering Procedure
BwVS	Braidwood Engineering Surveillance
BwVSR	Braidwood Engineering Surveillance Requirement
CC	Component Cooling Water
CFR	Code of Federal Regulations
CR	Condition Report
CRDM	Control Rod Drive Mechanism
CV	Chemical and Volume Control System
CVCS	Chemical and Volume Control System
DC	Direct Current
DG	Diesel Generator
EA	Escalated Action
EP	Emergency Preparedness
ERO	Emergency Response Organization
ESFAS	Engineered Safety Features Actuation System
FIN	Finding
GOCAR	Required Compensatory Measures Action Response
HDR	Header
HX	Heat Exchanger
IMC	Inspection Manual Chapter
ISI	Inservice Inspection
LCO	Limiting Condition for Operations
LCOAR	Limiting Condition for Operations Action Requirement
LER	Licensee Event Report
LSH	Lake Screen House
M/G	Motor/Generator
MWROG	Midwest Reactor Operators Group
NCV	Non-Cited Violation
PARS	Publicly Available Records
PORV	Power Operated Relief Valve
PT	Penetrant Testing
PWR	Pressurized Water Reactor
RH	Residual Heat Removal
RWST	Refueling Water Storage Tank

SDP	Significance Determination Process
SI	Safety Injection
SSC	Structures, Systems, or Components
SSPS	Solid State Protection System
SX	Essential Service Water
RCS	Reactor Coolant System
RG	Regulatory Guide
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
UHS	Ultimate Heat Sink
URI	Unresolved Item
USNRC	United States Nuclear Regulatory Commission
UT	Ultrasonic Testing
VIO	Violation
WO	Work Order
WS	Non-essential Service Water

## LIST OF DOCUMENTS REVIEWED

### 1R04 Equipment Alignment

BwOP DG-1	DG Alignment to Standby Condition	Revision 13
BwOP DO-E2	Electrical Lineup - Unit 2 Diesel Lube Oil	Revision 0
BwOP DG-E4	Electrical Lineup - Unit 2 2B DG	Revision 4
BwOP DG-M4	Operating Mechanical Lineup Unit 2 2B DG	Revision 8
BwOP DO-M8	Operating Mechanical Lineup Unit 2 DG Lube Oil	Revision 2
BwOP DO-M14	Operating Mechanical Lineup Unit 2 DG 2B Fuel Oil	Revision 2
BwOP FP-M1	Operating Mechanical Lineup Unit 0 LSH [lake screen house] and Outside Ring for HDR [header] Operating	Revision 8
BwOP FP-M6	Operating Mechanical Lineup Unit 0 Auxiliary Building Ring header Operating	Revision 3
TS 3.8.1	AC [alternating current] Sources - Operating	Amendment 108
UFSAR Section 8.3	Onsite Power System	Revision 8
Drawing M-126, Sheet 1	Diagram of AF Unit 2	Revision BL
Drawing M-130, Sheet 1B	Diagram of Diesel Oil and Fuel Oil System	Revision BH
Drawing M-152, Sheet 9	Manufactures Supplemental Diagram of DG Lube Oil Schematic Unit 1&2	Revision F
Drawing M-152, Sheet 10	Manufactures Supplemental Diagram of DG Fuel Oil Schematic	Revision H
Drawing M-152, Sheet 14	Manufactures Supplemental Diagram of DG Jacket Water Schematic Unit 1&2	Revision F
CR 00115860	USNRC Questions from 7/16/2002 Walkdown [USNRC-Identified]	July 16, 2002
BwOP AF-E1	Electrical Lineup - Unit 1 Operating	Revision 8
BwOP AF-M1	Operating Mechanical Lineup Unit 1	Revision 9
Drawing M-37	Diagram of Auxiliary Feedwater	Revision AY

## 1R05 Fire Protection

Fire Protection Report Section 2.3 (selected subsections)	Fire Area Analysis	Amendment 18
Fire Protection Report Section 2.4	Safe Shutdown Analysis for Braidwood-1 and Braidwood-2	Amendment 18
Fire Protection Report Section 3.2 (selected subsections)	Fire Hazards Analysis	Amendment 19
Table	Summary of Braidwood Fire Induced Core Damage Frequency Results	Based on Calculation BRW-97-0502-N
Exelon Procedure CC-AA-211	Fire Protection Plan	Revision 0
CR 00120167	Seal Details Not Consistently Referenced in Work Instruction [USNRC-Identified]	August 21, 2002
Dwg. A-1219	Block Wall Elevations Braidwood Station Units 1 & 2	Revision G
Exelon Procedure OP-AA-201-008	Pre-Fire Plans	Revision 0
WO 99242607	Install Temporary Power to 112 Constant Voltage Transformer Per BwOP AP-60T5	
WO 990042825 01	Instrument Bus 212 Transformer (2IP02E) Assembly Remove Temporary Power Cable to Inverter 2IP02E	May 12, 1999
NFPA 80	National Fire Protection Association National Fire Codes 1984, Section 80, "Standards For Fire Doors and Windows"	
CR 00123048	USNRC-Identified Fire Door Related Questions [USNRC-Identified]	September 12, 2002

## 1R06 Flood Protection Measures

BwAP 1110-3	Plant Barrier Impairment Program	Revision 11
Exelon Procedure CC-AA-201	Plant Barrier Impairment Permit 6340	Revision 3 July 22, 2002

Exelon Procedure CC-AA-309	Design Analysis approval 9900725 - Pending Revision to Auxiliary Building flood Level Calculation 3C8-0685-002 Revision 13	Revision 0
CR 00103150	Weaknesses Noted While Processing Plant Barrier Impairments for Approval	April 2, 2002
CR 00103593	Missing Gaskets on Temporary SX Draindown Fittings	April 11, 2002
CR 00116147	Inappropriate review of Work Scope for PBI	July 18, 2002
CR 00116242	USNRC-Identified Issues in SX Pump Rooms [USNRC-Identified]	July 18, 2002
CR 00116685	Nuclear Oversight Identified Work Package Procedure Adherence/Quality	July 23, 2002
CR 00117223	WE009 Pits Filling with Ground Water [USNRC-Identified]	July 23, 2002
CR 00120907	Flood Seal Plates Missing from SX Valve Pit Drain Valve Pits [USNRC-Identified]	August 28, 2002
WO 00410301 01	Inspection of Watertight Doors	August 9, 2002
	Braidwood Station Licensed Operator Requalification Simulator Scenario Guide 0241- Auxiliary Building SX Flooding	Revision 0
CR 00123233	Rags Left Around 2A Centrifugal Charging Pump Room Floor Drain [USNRC-Identified]	September 17, 2002
CR 00123749	Issues With Floor Drain Use/Awareness Warrent Reinforcement [USNRC-Identified]	September 19, 2002
CR 00123878	Discrepancy Between UFSAR and Auxiliary Building Flood Calculation [USNRC-Identified]	September 20, 2002
UFSAR Attachment D3.6	Flooding	Revision 7
UFSAR Section 9.3.3.2	Auxiliary Building Safety-Related Components Area Flood Analysis	Revision 8
Calculation 3C8-0685-002	Auxiliary Building Flood Level Calculations	Revision 13
0BwOA PRI-8	Auxiliary Building Flooding Unit 0	Revision 1

0BwOA SEC-5	WS [non-essential service water] Malfunction Unit 0	Revision 101
-------------	--	--------------

1R08 Inservice Inspection

EXE-PDI-UT-1	Ultrasonic Examination of Ferritic Pipe Welds in Accordance With PDI-UT-1	March 9, 2002
EXE-ISI-10	Ultrasonic Instrument Linearity Qualification	February 4, 2002
EXE-ISI-11	Liquid Penetrant Examination	July 20, 2001
EXE-UT-350	Procedure For Acquiring Material Thickness and Weld Contours	March 9, 2002
CR 00117699	Inadequate Revision to the Braidwood ISI Plan	July 31, 2002
CR 00120219	Error In A2RO9 ISI Summary Report [USNRC-Identified]	August 21, 2002
CR 00120024	A2RO9 ISI Indications Not Recorded On Appropriate Form	August 20, 2002
Relief Request 12R-39	Risk Informed ISI (USNRC Approval Letter)	February 20, 2002
	Braidwood Station Unit 2 ISI Summary Report	August 12, 2002
	ISI, Exelon Nuclear, Braidwood Unit 2, 2nd Interval, 2nd Period, 1 <sup>st</sup> Outage, A2RO9	April 2002

1R12 Maintenance Effectiveness

Maintenance Rule - Evaluation History	Systems AF, CC, and DG	
Maintenance Rule - Expert Panel Scoping Determination	Systems AF, CC, and DG	
Maintenance Rule - (a)(1) Action Plan	Systems AF, CC, and DG	
Maintenance Rule - Performance Criteria	Systems AF, CC, and DG	
CR 00105018	2SX033 Valve Orientation Different than Drawings (Valve Team)	April 23, 2002



CR 00106265	1SX001B Did Not Fully Close Electrically	May 1, 2002
CR 00107795	1C Reactor Containment Fan Cooler Flowrate Below TS Minimum	May 12, 2002
CR 00108977	Flow Through 2SX057A Had to be Adjusted per 2BwOSR [Braidwood Operating Surveillance Requirement] 3.6.6.2	May 21, 2002
CR 00111079	SX Flow to the 1C Reactor Containment Fan Cooler Out of Specification Low per 1BwOSR 3.6.6.2	June 7, 2002
CR 00113237	Open Action Request Tags in the Field for an Extended Period on SX Valves	June 24, 2002
CR 00116847	SX Flow Found Out of Tolerance Low to 2B DG During 2BwOSR 3.6.6.2	July 24, 2002
CR 00119491	2A DG Overspeed Trip During Testing	August 15, 2002
CR 00119501	Inadequate Thread Engagement on Turbocharger Flange - 2A DG	August 15, 2002
CR 00119617	"0" CC Pump Would not rotate - Cover in Contact w/Wear Ring	August 16, 2002
CR 00119639	Copper Particles in the Inboard Bearing Housing	July 14, 2002
CR 00119721	Potential Rework - 2A DG Trip During Cooldown Cycle Testing	August 16, 2002
CR 00119883	Damaged Parts Identified During DG Inspection (8L, 5R Cylinders)	August 19, 2002
CR 00119885	Damaged Parts Identified in the 2B 5R DG Head Assembly	August 19, 2002
CR 00119976	Microswitch for Relay 2DC1 Reads High Resistance	August 20, 2002
CR 00120314	Potential Trend - Maintenance Effectiveness of DG Work	August 22, 2002
CR 00120987	Inadequate DG Change Management Issue	August 28, 2002
EC 336758	Change Tolerance for the Orientation Angle of Valve 2SX033	Revision 0
ER 98-047	1A SX Pump Discharge Isolation Valve, 1A SX Cross-Tie Valve	October 3, 1998

WO 99228667 01	Starting System Lockout Test for 2A DG	July 14, 2002
WO 00420607 01	Measure Diesel Turbocharger Spin Down Time	August 16, 2002
WO 00444818 03	Assist Electrical Maintenance Department with Removal/Installation of New Motor	July 5, 2002
WO 00447209 01	ASME Surveillance Requirements for CC Pump OCC01P	August 16, 2002
WO 00449659 01	ASME Surveillance Requirements for 2A AF Pump	August 8, 2002
WO 00457383 01	2A DG Operability Monthly	July 14, 2002
WO 00463613 07	Contingency Work Package for Troubleshooting During Post Test Perform Overspeed Test BwVS [Braidwood Engineering Surveillance] 900-6	August 15, 2002
WO 00463613 08	Contingency Work Package for Troubleshooting During Post Test Perform 2BwVSR [Braidwood Engineering Surveillance Requirement] 3.8.1.14-1	August 15, 2002
WO 990243176 01	Inspect for Cavitation Damage	January 25, 2002
	Electronic Operating Logs	August 6, 2001, through August 6, 2002
	Electronic Unit 1 and 2 Control Room Log Entries	September 3, 2002, through September 3, 2002
	Electronic Control Room Log Search (Search Criteria 3.8.1, DG, Emergency DG)	September 4, 2001, through September 4, 2002

1R13 Maintenance Risk Assessments And Emergent Work Control

Exelon Procedure WC-AA-101	On-Line Work Control Process	Revision 6
BwAP 1110-1A4	GOCAR [Required Compensatory Measures Action Response] Carbon Dioxide Fire Suppression Systems	Revision 8
2BwOA ROD-2	Failure of Rods to Move Unit 2	Revision 54A

2BwOA ROD 3	Dropped or Misaligned Rod Unit 2	Revision 101
BwOP FP-22	Impairment of the Carbon Dioxide Fire Suppression Systems	Revision 3
2BwOSR 3.3.1.4-2	Unit Two SSPS, Reactor Trip Breaker, and Reactor Trip Bypass Breaker Bi-Monthly Surveillance (B Train)	Revision 12
2BwVS 8.1.1.2.e-2	2B DG 18 Month, 5 Year and 20 Year Inspections	Revision 6
CR 00114516	Reactor Trip Breaker Failed to Close on Demand During 2BwOSR 3.3.1.4-2	July 5, 2002
CR 00114586	B Train SSPS Inoperability - K504 Found Energized	July 5, 2002
CR 00115873	Online Risk Assessment Monitor Evaluation Not Performed When OA Fire Pump Taken Out of Service	July 17, 2002
CR 00115888	2CV01PA Seal Leakage at 1500 cubic centimeters per minute	July 17, 2002
CR 00119319	2A DG Turbo Thrust Bearing Trip During Testing	August 14, 2002
CR 00119319	Rework-2A DG Turbo Thrust Bearing Trip During Testing - Unplanned LCO	August 14, 2002
CR 00119491	2A DG Overspeed Trip During Testing	August 15, 2002
CR 00119721	Potential Rework - 2A DG Trip During Cooldown Cycle Testing	August 16, 2002
CR 00119337	Loss of Instrument Air Pressure on Both Units	August 14, 2002
CR 00119751	LSH Fish Cause Elevated Strainer/Screen Differential Pressures, 1SX01PB LCOAR	August 19, 2002
CR 00120113	Backwash Bearing on 1B SX Strainer Found Swollen	August 19, 2002
CR 00120745	Failure in Rod Drive System - 3 Annunciators in the Main Control Room	August 27, 2002
CR 00120753	Unit 2 Dropped Control Bank Rod	August 27, 2002
Exelon Procedure MA-AA-716-004, Attachment 2	Complex Troubleshooting - Fault in field or 3-Phase Power Feeds	Revision 0

WO 441439-01	2PA10J Contingency Troubleshooting SSPS Train B with Demux Cabinets	July 5, 2002
WO 99055679 01	Perform 5 Year Inspection of 2A DG	July 8, 2002
WO 99228667 02	BwMP [Braidwood Maintenance Procedure] 3100-22, Revision 13, "DG 2 Year Inspection"	July 14, 2002
WO 99260828 01	2A DG 24 Hour Endurance run	August 14, 2002
WO 99273575 01	Surveillance of Unit 1 Upper Cable Spreading Room Detection Zones	July 17, 2001
WO 00183803 01	Inboard Seal Leaks Approximately 0.23 gpm. Adjust Seal. 2A CV	July 25, 2002
WO 00324284 02	Remove Blocking Diodes and Rewire	April 25, 2002
	Shift Manager Log - Shift 2	August 14, 2002
	Shift Manager Log - Shift 2	August 27, 2002
	Shift Manager Log - Shift 3	July 24, 2002
	Root Cause Investigation Charter for AF 1SX01FB Strainer High Differential Pressure	
Drawing ST-32910	Adams Vertical Automatic Strainer Parts List	March 15, 1978

1R15 Operability Evaluations

CR 00115439	No Acoustic Indication of 1SX101A Opening During 1A AF ASME	July 12, 2002
WO 00433835 01	Unit One Motor-Driven AF Pump ASME Quarterly Surveillance	July 15, 2002
BRW-96-233 E20-1/2-96-228	Results of the 2A AF Pump Auxiliary Lube Oil Pump Pressure Interlock Time Test Under Cold Oil Conditions	December 5, 1996
CR 00119751	Lake Screen House Fish Cause Elevated Strainer Differential Pressure	August 19, 2002
CR 00120113	Backwash Bearing on 1B Service Water Strainer Found Swollen	August 19, 2002
Drawing ST-32910	Adams Vertical Automatic Strainer Parts List	March 15, 1978

CR 00119319	2A Emergency Diesel Generator Turbocharger Thrust Bearing Trip During Testing	August 14, 2002
	Shift Manager Log	August 14, 2002
Drawing ET 24-1-4	Cooper-Bessemer Turbocharger	November 19, 1995
CR 00119337	Loss of Instrument Air Pressure on Both Units	August 14, 2002
CHRON 303085	SX Flow to Lube Oil Coolers at 32 Degrees F	September 30, 1994
Memo	Revision of Temporary Alteration 95-2-009 Safety Evaluation	January 31, 1996
Dwg. 300-B50090	Pacific Pumps Located Lube Oil Cooler Connection L-M1 & L-N1	Revision 4
Apparent Root Cause Evaluation for CR 00110320	Fisher 67CFR Regulators Failed to Bleed Off Regulator Outlet Pressure	July 18, 2002

1R19 Post Maintenance Testing

WO 00343483 01	Fire Protection Pump Flow and Pressure Test	July 18, 2002
WO 00362936	2B CV Seals Spraying Oil	
WO 00470793 01	Unit Common 24 Volt DC [direct current] Diesel Fire Pump Battery Bank 1 and 2 Monthly Surveillance	August 25, 2002
WO 00470798 01	Diesel-Driven Fire Pump Monthly Surveillance	August 25, 2002
2BwVSR 3.8.1.14-1	Unit 2 2A DG 24 Hour Endurance Run 18 Month	Revision 1
2BwVSR 5.5.8.CV 2	ASME Surveillance Requirement For 2B CV and Check Valve 2CV8480B Stroke Test	Revision 4
BwVS 4.5.2.f.1.b	Surveillance Requirement For _B CV Discharge Pressure	Revision 4
Dwg. M-52	Diagram of Fire Protection at Lake Screen House Units 1 & 2	October 12, 1999
	Shift Manager Log - Shift 2	July 20, 2002

2BwVS 8.1.1.2.f-6	Starting System Lockout Test for 2B DG	Revision 4
BwVS 900-6	_A/B DG Overspeed Trip Test	Revision 9
2BwOSR 3.8.1.2-2	Unit Two 2B Diesel Generator Operability Monthly and Semi-annual Surveillance	Revision 6
BwVS 900-8	DG Engine Analysis	Revision 7
BwOP DG-1	DG Alignment to Standby Condition	Revision 14
BwOP DG-11	DG Startup	Revision 24
BwOP DG-12	DG Shutdown	Revision 16
WO 00458010	Unit 1 Diesel Driven Auxiliary Feedwater Pump ASME Quarterly Surveillance	September 20, 2002
1BwOSR 3.7.5.3-2	Unit 1 Diesel Driven Auxiliary Feedwater Pump Monthly Surveillance	Revision 1

1R20 Refueling and Outage Activities

BwVS 500-1	Rod Control System Checkout (CRDM [control rod drive mechanism] Timing) Following Refueling	Revision 8
CR 00120753	Unit 2 Dropped Control Rod - Control Bank 'C' Rod K6	August 27, 2002
CR 00120793	DC Bus 212 Ground (+ 125 Volts DC) Tied to 2B DG	August 27, 2002
CR 00120807	Shutdown Margin Surveillance and Rod Insertion Limit Validity with a Dropped Rod	August 28, 2002
CR 00120808	DC Bus 112 Ground Spike	August 28, 2002
CR 00120952	Rigor of Rod Control Troubleshooting in Outage Control Center	August 28, 2002
CR 00121035	Unexpected Alarms Received During Main Steam Isolation Valve Strokes	August 29, 2002
CR 00121129	Control Bank "C" Group 1 Step Counter Will Not Reset to 000	August 29, 2002
CR 00121130	With Control Bank "C" Selected, Local Indication for Control Bank "A" Observed	August 29, 2002
CR 00121300	2BwOA ROD-2 Unexpected Entry Due to Urgent Failure Alarm	August 31, 2002

CR 00121301	2FW510 Discovered Unexpectedly Oscillating	August 31, 2002
CR 00121316	Multiple Loose Parts System Annunciators During Unit 2 Ramp	August 31, 2002
CR 00121664	Tave/Tref Deviation During Unit 2 Ramp to 50 Percent Power	August 31, 2002
	Shift Manager Log	August 31, 2002

1R22 Surveillance Testing

Letter: S. Richards to O. Kingsley	Evaluation of the Second 10-Year Interval ISI Program Plan Requests for Relief - Braidwood Station, Units 1 and 2 (TAC Nos. MA1612 and MA 1613)	October 26, 1998
Letter: J. D. von Suskil to the USNRC	Reply to a Notice of Violation	January 11, 2002
Letter: J. D. von Suskil to the USNRC	Follow-up Reply to a Notice of Violation	May 3, 2002
Letter: J. D. von Suskil to the USNRC	Additional Information Regarding a Reply to a Notice of Violation	July 24, 2002
Letter: J. D. von Suskil to the USNRC	Revised Response to a Notice of Violation	August 19, 2002
Letter: Ann Marie Stone to John L. Skolds	Reply to Licensee's Response to Cited Violation for USNRC Inspection Report 50-456/01-11; 50-457/01-11, Braidwood Station, Units 1 & 2	March 11, 2002
Letter: Ann Marie Stone to John L. Skolds	Notice of Significant Meeting	July 16, 2002
AM-2002-18	Focus Area Self-Assessment on Generic Letter 88-05	August 8, 2002
1BwOSR 0.1-1,2,3	Unit One - Modes 1,2, and 2 Shiftly and Daily Operating Surveillance Data Sheet	Revision 18
Braidwood Operating Limiting Condition for Operations Action Requirement 1BwOL 3.7.9	LCOAR Ultimate Heat Sink (UHS) TS LCO 3.7.9	Revision 1

BwOP CS-5	Containment Spray System Recirculation to the RWST [refueling water storage tank]	
BwOP SI-1	Safety Injection System Startup	Revision 13
BwOP SI-2	SI System Shutdown	Revision 9
0BwOS IS-Q1	Unit Common Security DG Quarterly Surveillance (Loaded Run)	Revision 4
1BwOSR 3.3.2.8-644A	Unit 1 ESFAS [engineered safety feature actuation system] Instrumentation Slave Relay Surveillance	Revision 0
1BwOSR 3.6.3.5.CS-1A	Train A Containment Spray Containment Isolation Valve Stroke Quarterly Surveillance	Revision 1
Braidwood Engineering Procedure (BwVP) 200-11	Evaluation of ASME Class 1, 2, and 3 Bolted Connections	Revision 1
BwVSR 5.5.2.a	Leakage Testing Requirements for Potentially Radioactive Components Outside Containment	Revision 1
1BwVSR 5.5.8.CS.1	ASME Surveillance Requirements for 1A Containment Spray Pump and Check Valves 1CS003A, 1CS011A	Revision 3
1BwVSR 5.5.8.SI.1	ASME Surveillance Requirements for the 1A SI Pump	Revision 4
WO 360167-01	"Run Diesel" Not Displayed at Control Center	December 17, 2001
WO 445663 01	ASME Surveillance Requirement for 1A SI Pumps	August 7, 2002
Exelon Procedure CC-AA-404	Maintenance Specification: Application Selection, Evaluation and Control of Leak Sealant Injection and Temporary Leak Repair	Revision 3
Dwg. M-61	Diagram of SI Unit 1	June 4, 1985
Information Notice 97-16	Preconditioning of Plant SSC Before ASME Code Inservice Testing or TS Surveillance Testing	April 4, 1997



2BwVSR 3.8.1.13-2	2B DG Bypass of Automatic Trips Surveillance	Revision 5
BwOP DG-11	DG Startup	Revision 24
BwOP DG-12	DG Shutdown	Revision 16
CR 00115214	Inadequate Procedure Could Lead to a Configuration Event	July 2, 2002
CR 00120219	Error in A2R09 ISI Summary Report [USNRC-Identified]	August 12, 2002
CR 00121242	1B SI Pump Motor Vibration Showing an Upward Trend	
CR 00121570	Incorrect Reference in UFSAR [USNRC-Identified]	September 3, 2002
CR 00121584	Documentation Error in Borated Bolted Connection Evaluation [USNRC-Identified]	September 3, 2002
CR 00123626	USNRC Concern - Borated Bolt Inspection Required on Unit 1 Spent Fuel Pool Heat Exchanger Leak [USNRC-Identified]	September 19, 2002
Exelon Procedure ER-AA-330-002	ISI of Welds and components	Revision 0
WO 99207482 01	Visual Exam of SI System Outside Containment	April 25, 2002
WO 99225357 02	Visual Exam of SI System Outside Containment	June 12, 2002
WO 99231710 01	2B DG Bypass of Automatic Trips	August 21, 2002
WO 99246731 01	Visual Exam of Class 1 Components	May 9, 2002
WO 99246732 01	Visual Exam Per Generic Letter 88-05 (Class 1)	April 16, 2002
WO 99247706 01	Examination of Unit 2 Borated Bolted	April 9, 2002
	Visual Examination Data Form VT-2-2.1 2CV8401A (C-H)	April 11, 2002
	Visual Examination Data Form VT-1-2.2 2CV88160 (C-H)	April 22, 2002

1EP6 Drill Evaluation

0243 EP Exercise	RCS High Activity Reactor Coolant Pump High Vibration/Large Break Loss of Coolant Accident/Hot Leg Recirculation	Revision 0
CR 00111085	1C Reactor Coolant Pump Vibration Monitor Equipment Noted High Vibration	June 7, 2002
Exercise Scenario	Braidwood 2002 Pre-Exercise	September 13, 2002
Exelon Procedure EP-AA-114	Notifications	Revision 2
Exelon Procedure EP-MW-114-100	MWROG [Midwest Reactor Operating Group] Offsite Notifications	Revision 0
CR 00119990	EP [emergency preparedness] Improvement Items for ERO [emergency response organization] Performance	August 7, 2002
CR 00120006	EP Improvement Items for ERO Readiness	August 7, 2002
CR 00119982	EP ERO Performance Enhancements	August 7, 2002
CR 00119996	EP Enhancements for Procedures/Facilities	August 7, 2002
CR 00120010	EP Enhancements for Program Administration	August 7, 2002
CR 00120015	EP Deficiencies Identified for ERO Performance	August 20, 2002
CR 00119956	EP Equipment/Facility Improvement Items	August 7, 2002
CR 00119349	Nuclear Oversight Identified EP Team D Training Enhancements	August 14, 2002
CR 00119860	EP Exercise Management/Scenario Improvement Items	August 7, 2002
CR 00123560	Nuclear Oversight Identified ERO Performance Deficiencies During Pre-Exercise	August 13, 2002