



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
2443 WARRENVILLE ROAD, SUITE 210  
LISLE, IL 60532-4352

May 13, 2009

Mr. Charles G. Pardee  
Senior Vice President, Exelon Generation Company, LLC  
President and Chief Nuclear Officer (CNO), Exelon Nuclear  
4300 Winfield Road  
Warrenville IL 60555

**SUBJECT: BRAIDWOOD STATION, UNITS 1 AND 2, NRC INTEGRATED INSPECTION  
REPORT 05000456/2009002 AND 05000457/2009002**

Dear Mr. Pardee:

On March 31, 2009, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Braidwood Station, Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on April 17, 2009, with Mr. B. Hanson, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and 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.

The report documents one NRC-Identified finding and one self-revealing finding of very low safety significance (Green). The NRC-Identified finding was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because the issue was entered into your corrective action program, the NRC is treating the finding as a Non-Cited Violation (NCV), consistent with Section VI.A.1 of the NRC's Enforcement Policy.

If you contest any 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 copies to the Regional Administrator, U.S. Nuclear Regulatory Commission - Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector Office at the Braidwood Station. In addition, if you disagree with the characterization of any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement to the Regional Administrator, Region III, and the NRC Resident Inspector at the Braidwood Station. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-erm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Richard A. Skokowski, Chief  
Branch 3  
Division of Reactor Projects

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

Enclosure: Inspection Report 05000456/2009002; 05000457/2009002  
w/Attachment: Supplemental Information

cc w/encl: Site Vice President - Braidwood Station  
Plant Manager - Braidwood Station  
Manager Regulatory Assurance - Braidwood Station  
Chief Operating Officer and Senior Vice President  
Senior Vice President - Midwest Operations  
Senior Vice President - Operations Support  
Vice President - Licensing and Regulatory Affairs  
Director - Licensing and Regulatory Affairs  
Manager Licensing - Braidwood, Byron and LaSalle  
Associate General Counsel  
Document Control Desk - Licensing  
Assistant Attorney General  
J. Klinger, State Liaison Officer,  
Illinois Emergency Management Agency  
Chairman, Illinois Commerce Commission

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cc w/encl: Site Vice President - Braidwood Station  
Plant Manager - Braidwood Station  
Manager Regulatory Assurance - Braidwood Station  
Chief Operating Officer and Senior Vice President  
Senior Vice President - Midwest Operations  
Senior Vice President - Operations Support  
Vice President - Licensing and Regulatory Affairs  
Director - Licensing and Regulatory Affairs  
Manager Licensing - Braidwood, Byron and LaSalle  
Associate General Counsel  
Document Control Desk - Licensing  
Assistant Attorney General  
J. Klinger, State Liaison Officer,  
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SUBJECT: BRAIDWOOD STATION, UNITS 1 AND 2, NRC INTEGRATED INSPECTION  
REPORT 05000456/2009002; 05000457/2009002

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 05000456; 05000457

License Nos: NPF-72; NPF-77

Report No: 05000456/2009002 and 05000457/2009002

Licensee: Exelon Generation Company, LLC

Facility: Braidwood Station, Units 1 and 2

Location: Braceville, Illinois

Dates: January 1, 2009, through March 31, 2009

Inspectors: B. Dickson, Senior Resident Inspector  
A. Garmoe, Resident Inspector  
J. Bozga, Reactor Inspector  
M. Mitchell, Health Physicist  
R. Ng, Project Engineer  
M. Thorpe-Kavanaugh, Reactor Engineer  
M. Perry, Resident Inspector,  
Illinois Department of Emergency Management

Approved by: R. Skokowski, Chief  
Branch 3  
Division of Reactor Projects

Enclosure

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## SUMMARY OF FINDINGS

IR 05000456/2009002, 05000457/2009002; 01/01/2009 -03/31/2009; Braidwood Station, Units 1 & 2. Evaluation of Changes, Tests, or Experiments and Permanent Plant Modifications; Followup of Events.

This report covers a 3-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. One Green finding was identified by the inspectors and one Green finding was self-revealed. The inspector-identified finding was considered a Non-Cited Violation (NCV) of Nuclear Regulatory Commission (NRC) requirements and the self-revealed finding was not associated with a violation of NRC requirements. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

### A. NRC-Identified and Self-Revealed Findings

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

- Green. A Green finding was self-revealed on December 27, 2008, when excessively long motor leads caused a phase to phase overcurrent trip of the 2C heater drain pump and subsequent Unit 2 reactor trip. Specifically, adequate procedural guidance on re-terminating the 2C heater drain pump motor leads following refurbishment was not provided, which resulted in excessive motor lead length. This issue was entered into the licensee's corrective action program as Issue Report (IR) 860458. Since the procedures that govern activities on equipment that is not used to prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public, such as the heater drain pump, this finding does not represent a violation of regulatory requirements.

The inspectors determined the finding was more than minor because it impacted the procedure quality attribute of the Initiating Events Cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The inspectors determined the issue was of very low safety significance because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. There is no cross-cutting aspect associated with this finding because the development of the inadequate procedure did not reflect current performance. (Section 4OA3.3)

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

- Green. A finding of very low safety significance and an associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for the licensee's failure to properly evaluate the addition of lead shielding to Unit 2 safety injection piping. Specifically, the licensee did not have sufficient rationale and incorrectly concluded that sufficient margin existed in the pipe support design with the additional weight. The licensee entered the issue into their corrective

action program, revised associated calculations, and planned modifications as needed to restore required design margins.

The finding was determined to be more than minor because compliance with Seismic Category I design requirements was necessary to ensure the Subsystem 2S106 pipe supports would function as required during a Seismic Category I design basis event. The finding screened as having very low safety significance because the design deficiency was confirmed not to result in loss of operability of the safety injection pipe supports. The cause of the finding is related to the cross-cutting component of Human Performance, Resources, because the licensee did not maintain adequate design margins (H.2(a)). (Section 1R17.1.b)

**B. Licensee-Identified Violations**

No findings of significance were identified.



## REPORT DETAILS

### Summary of Plant Status

Unit 1 operated at or near full power until March 27, 2009, when reactor power was reduced to 93 percent for main steam relief valve testing. On March 28, the reactor was returned to near 100 percent power until March 29, when the reactor was shut down to commence a scheduled refueling outage.

Unit 2 operated at or near full power for the entire inspection period.

### **1. REACTOR SAFETY**

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

#### 1R01 Adverse Weather Protection (71111.01)

##### .1 Readiness For Impending Adverse Weather Condition – Extreme Cold Conditions

###### a. Inspection Scope

Since extreme cold conditions were forecast in the vicinity of the facility for January 15, 2009, the inspectors reviewed the licensee's overall preparations/protection for the expected weather conditions. On January 15, the inspectors walked down fire protection piping, emergency diesel generator and auxiliary building exhaust and ventilation ducts, and other equipment near outer walls and windows of the plant because their safety-related functions could be affected or required as a result of the extreme cold conditions. The inspectors observed insulation, heat trace circuits, space heater operation, and weatherized enclosures to ensure operability of affected systems. The inspectors reviewed licensee procedures and discussed potential compensatory measures with control room personnel. The inspectors focused on plant management's actions for implementing the station's procedures for ensuring adequate personnel for safe plant operation and emergency response would be available. Specific documents reviewed during this inspection are listed in the Attachment.

This inspection constituted one readiness for impending adverse weather condition sample as defined in Inspection Procedure (IP) 71111.01-05.

###### b. Findings

No findings of significance were identified.

#### 1R04 Equipment Alignment (71111.04)

##### .2 Quarterly Partial System Walkdowns

###### a. Inspection Scope

The inspectors performed partial system walkdowns of the following risk-significant systems:

- 1A Residual Heat Removal (RH) Prior to 1B RH Work Window;
- 1B Essential Service Water (SX) with 1A SX Pump Inoperable for 2A SX Maintenance; and
- 2B Auxiliary Feedwater (AF).

The inspectors selected these systems based on their risk significance relative to the Reactor Safety Cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could impact the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, Updated Final Safety Analysis Report (UFSAR) sections, Technical Specification (TS) requirements, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the correction action program (CAP) with the appropriate significance characterization. Documents reviewed are listed in the Attachment.

These activities constituted three partial system walkdown samples as defined in IP 71111.04-05.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

The inspectors conducted fire protection walkdowns which were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- Auxiliary Building 346' Elevation General Area (Fire Area 11.2);
- Fuel Handling Building (Fire Area 12.1-0);
- Unit 1 Auxiliary Electrical Equipment Room (Fire Area 5.5-1);
- Unit 1 Miscellaneous Electrical Equipment Room (Fire Areas 5.4-1,2); and
- Unit 2 Miscellaneous Electrical Equipment Room (Fire Areas 5.6-1,2).

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, maintained passive fire protection features in good material condition, and had implemented adequate compensatory measures for out of service, degraded or inoperable fire

protection equipment, systems, or features in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the Attachment, the inspectors verified 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 fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's CAP. Documents reviewed are listed in the Attachment to this report.

These activities constituted five quarterly fire protection inspection samples as defined in IP 71111.05-05.

b. Findings

No findings of significance were identified.

1R07 Annual Heat Sink Performance (71111.07)

.1 Heat Sink Performance

a. Inspection Scope

The inspectors reviewed the licensee's testing of the unit common component cooling water heat exchanger to verify that potential deficiencies did not mask the licensee's ability to detect degraded performance, to identify any common cause issues that had the potential to increase risk, and to ensure that the licensee was adequately addressing problems that could result in initiating events that would cause an increase in risk. The inspectors reviewed the licensee's observations as compared against acceptance criteria, the correlation of scheduled testing and the frequency of testing, and the impact of instrument inaccuracies on test results. Inspectors also verified that test acceptance criteria considered differences between test conditions, design conditions, and testing conditions.

This annual heat sink performance inspection constituted one sample as defined in IP 71111.07-05.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations (71111.12Q)

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk-significant systems:

- Reactor Trip Breakers, and
- SX Air Operated Valves.

The inspectors reviewed events such as where ineffective equipment maintenance had resulted in valid or invalid automatic actuations of engineered safeguards systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- implementing appropriate work practices;
- identifying and addressing common cause failures;
- scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring;
- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- verifying appropriate performance criteria for systems, structures, and components/functions classified as (a)(2) or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two quarterly maintenance effectiveness samples as defined in IP 71111.12-05.

b. Findings

No findings of significance were identified.

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

.1 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the licensee's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- 2B AF Pump Failed Monthly Surveillance;
- 2B Heater Drain Pump Extent of Condition Work;
- 2A SX Work Window;
- 2A AF Slave Relay Surveillance; and
- Bus 111 Inverter and Unit 1 Component Cooling Heat Exchanger Out-of-Service with Potential Severe Weather.

These activities were selected based on their potential risk significance relative to the Reactor Safety Cornerstones. As applicable for each activity, the inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4) and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed TS requirements and walked down portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

These maintenance risk assessments and emergent work control activities constituted five samples as defined in IP 71111.13-05. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- 1B Diesel Generator Low Lube Oil Temperature During Surveillance Testing;
- 2B AF Pump Time Delay Relay Setpoint Discrepancy;
- 1SX001B Valve Limit Switch Missing Contact Button;
- Control Room Envelope Habitability Program Test Results Do Not Meet Regulatory Guide 1.78, Revision 0; and
- Fuel Handling Building Crane Runway Extension.

The inspectors selected these potential operability issues based on the risk-significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TS and UFSAR to the licensee's evaluations, to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the

evaluations. Additionally, the inspectors also reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment.

These operability inspections constituted five samples as defined in IP 71111.15-05.

b. Findings

No findings of significance were identified.

1R17 Evaluation of Changes, Tests, or Experiments and Permanent Plant Modifications (71111.17)

.1 (Closed) Unresolved Item (URI) 05000457/2008008-01, "Additional Information Needed to Determine Adequacy of Safety Injection (SI) Unit 2 SI06 Pipe Supports"

a. Inspection Scope

Unresolved Item 05000457/2008008-01 was opened during the Fall 2008 baseline inspection of changes, tests or experiments, and permanent plant modifications due to past operability concerns associated with discrepancies in the 2SI06 pipe subsystem support calculations. During this inspection period, the inspectors reviewed related documents to determine the adequacy of the licensee's past operability evaluation. This review did not represent an inspection sample.

b. Findings

Safety Injection Pipe Support Deficiencies

Introduction: A finding of very low safety significance (Green) and an associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for the licensee's failure to properly evaluate the addition of lead shielding to 2SI06 piping subsystem. Specifically, the licensee did not have sufficient rationale and incorrectly concluded that sufficient margin existed in the pipe support design with the additional weight. The licensee entered the issue into their corrective action program, revised associated calculations, and planned modifications as needed to restore required design margins.

Description: The SI system is part of the emergency core cooling system (ECCS). The Braidwood UFSAR, Section 6.3.1, states the primary function of the ECCS is to remove the stored and fission product decay heat from the reactor during accident conditions. The ECCS also provides shutdown capability for design basis accidents by means of boron injection. The ECCS is classified as a safety class II system designed to meet seismic category I requirements.

The 2SI06 piping subsystem has lines associated with the ECCS pump suction header from the refueling water storage tank (RWST) and containment sump, the 2A containment spray pump suction from the RWST and the Unit 2 RH pump suction from the Unit 2 reactor coolant system (RCS) hot leg.

The inspectors reviewed Calculation BRW-97-0827-M, "Piping Evaluation for Lead Shielding Installation on Subsystem 2SI06 Piping per Temporary Lead Shielding Request (TSR) No. 95-153, 96-018, 96-045, 96-053, and 97-120," Revision 0 and Minor Revision 0A. The purpose of Revision 0 was to evaluate the effect of the temporary lead shielding installed on the 2SI06 piping subsystem (i.e., lead shielding installed on sections of pipelines 2RH01BA-12", 2RH01BB-12", 2RH01CA-16", 2RH01CB-16", 2SI06BA-24", and 2SI06BB-24") by the TSRs. The purpose of Minor Revision 0A was to evaluate the affect of converting the aforementioned TSRs and three additional lead shielding installations 03-033, 03-035 and 03-052 to permanent lead shielding. In addition, Minor Revision 0A identified that based on recent industry concerns the lead shielding weighed up to 10 percent more than was previously analyzed.

In Calculation BRW-97-0827-M, Revision 0, the licensee's qualification of the pipe supports were based on their review of Calculation 13.2.29, "Structural Calculation for Mechanical Component Support [Pipe Support Number]," Revision 2, and the use of engineering judgment. The licensee concluded that sufficient margin existed in the pipe support design such that the supports would be able to withstand the increased loads from the installed lead shielding.

The inspectors reviewed the Structural Calculation for Mechanical Component Support (Pipe Support Number) contained in Calculation 13.2.29, Revision 2, for the following:

<u>Pipe Support Number</u>	<u>Pipe Support Number</u>	<u>Pipe Support Number</u>
2SI06309X	2SI06328X	2SI06342X
2SI06310X	2SI06335X	2SI06345X
2SI06311G	2SI06336X	2SI06351X
2SI06316X	2SI06337X	2SI06358X
2SI06318X	2SI06340S	2SI06360X

The inspectors determined that the engineering judgment used in Calculation BRW-97-0827-M, Revision 0, was not valid and without more thorough calculations it could not be determined whether or not the aforementioned pipe supports exceeded their design basis and operability acceptance limits. The licensee initiated IR 816677, "NRC MOD/50.59 Inspection 2SI06 Piping Subsystem Support," dated September 11, 2008, to address this issue.

In response to IR 816677, the licensee initially concluded through analysis that the fillet weld connection between the attachment plate and the embedment plate for pipe support 2SI06316X, assuming a size depicted in the design, exceeded design basis and operability limits. The licensee performed a walkdown to field verify the actual fillet weld size of this connection. The actual fillet weld size was determined to be 7/16" thick, which was greater than the 1/4" thick fillet weld size used in the analysis. Therefore, the licensee determined that the pipe support 2SI06316X fillet weld connection exceeded the design basis limits but was within operability acceptance limits.

Further analysis by the licensee showed pipe supports 2SI06328X, 2SI06340S, 2SI06345X, and 2SI06358X exceeded their design basis limits. The concrete expansion anchor bolt evaluation for each pipe support resulted in a factor of safety of less than

four, the design basis value, but greater than two. A factor of safety of greater than two satisfies the operability requirements specified in Procedure OP-AA-108-115, "Operability Determinations (CM 1)," Revision 6.

At the time of inspection, pipe support 2SI06318X was determined to have no margin for design basis acceptance limits and pipe support 2SI06337X had minimal design basis margin remaining. The licensee determined that the pipe supports 2SI066309X, 2SI06310X, 2SI06311G, 2SI06335X, 2SI06336X, 2SI06342X, 2SI06351X, and 2SI06360X met design basis and operability acceptance limits.

Analysis: The inspectors determined that the inadequately designed Subsystem 2SI06 pipe supports were a performance deficiency because the aforementioned pipe supports were not in conformance with design basis Seismic Category I requirements.

The finding was determined to be more than minor in accordance with IMC 0612, Appendix B, "Issue Screening," Minor Question 4 because the finding was associated with the Mitigating Systems cornerstone attribute of design control and affected the cornerstone objective of ensuring the availability, reliability, and capability of Subsystem 2SI06 piping during a Seismic Category I design basis event. Specifically, compliance with Seismic Category I design requirements was to ensure the Subsystem 2SI06 pipe supports would function as required during a Seismic Category I design basis event.

The inspectors answered "yes" to Question 1 under the mitigating systems cornerstone column of IMC 0609, Attachment 4, Table 4a, Phase 1 worksheet. Specifically, the design deficiency was confirmed not to result in a loss of operability of the Subsystem 2SI06 pipe supports. The inspectors agreed with the licensee's position that the Subsystem 2SI06 pipe supports were operable. Therefore, the inspectors concluded that the finding did not represent an actual loss of safety function, and the issue screened out as having very low safety significance (Green).

The cause of the finding is related to the cross-cutting component of Human Performance, Resources, because the licensee did not maintain adequate design margins (H.2(a)). Specifically, when converting the temporary shielding requests to permanent lead shielding, the licensee failed to adequately evaluate the pipe supports to demonstrate Seismic Category I compliance. The licensee did not review the impact on the calculation of record. The inspectors determined that this finding reflected current performance in that given the scope of the revision, it was reasonable to have expected the licensee's analysis to have included a review of the impact on the original calculation. That review either was not accomplished or was not accomplished adequately, in that the licensee accepted the same incorrect qualitative rationale.

Enforcement: 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. Also, design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculation methods, or by the performance of a suitable testing program.



Contrary to the above, from November 3, 1997 to September 11, 2008, the licensee's design control measures failed to verify the design adequacy of Subsystem 2SI06 pipe supports 2SI06316X, 2SI06328X, 2SI06340S, 2SI06345X, and 2SI06358X. Specifically, Calculation BRW-97-0827-M Revision 0 and Minor Revision 0A, which analyzed the aforementioned Subsystem 2SI06 pipe supports for design basis loading conditions with the addition of lead shielding, contained an invalid engineering basis affecting the design basis for seismic analysis. However, because this violation was of very low safety significance and was entered into the licensee's CAP as IR 816677, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000457/2009002-01).

Based on the above discussion, URI 5000457/2008008-01 is closed.

1R19 Post-Maintenance Testing (71111.19)

.1 Post-Maintenance Testing

a. Inspection Scope

The inspectors reviewed the following post-maintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- Bus 111 Inverter Following Replacement, and
- 2B AF Pump Battery Charger Following Maintenance.

These activities were selected based upon the structure, system, or component's ability to impact risk. The inspectors evaluated these activities for the following (as applicable): the effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed; acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate; tests were performed as written in accordance with properly reviewed and approved procedures; equipment was returned to its operational status following testing (temporary modifications or jumpers required for test performance were properly removed after test completion), and test documentation was properly evaluated. The inspectors evaluated the activities against TS, the UFSAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with post-maintenance tests to determine whether the licensee was identifying problems and entering them in the CAP and that the problems were being corrected commensurate with their importance to safety. Documents reviewed are listed in the Attachment.

This inspection constituted two post-maintenance testing sample as defined in IP 71111.19-05.

b. Findings

No findings of significance were identified.

## 1R20 Outage Activities (71111.20)

### .1 Refueling Outage Activities

#### a. Inspection Scope

The inspectors reviewed the Outage Safety Plan (OSP) and contingency plans for the Unit 1 refueling outage (RFO), which began on March 29, 2009, to confirm that the licensee had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured defense-in-depth was maintained. During the RFO, the inspectors observed portions of the shutdown and cooldown process and monitored licensee controls over the outage activities listed below.

- licensee configuration management, including maintenance of defense-in-depth commensurate with the OSP for key safety functions and compliance with the applicable TS when taking equipment out-of-service.
- implementation of clearance activities and confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing.
- installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication, accounting for instrument error.
- controls over the status and configuration of electrical systems to ensure that TS and OSP requirements were met, and controls over switchyard activities.
- monitoring of decay heat removal processes, systems, and components.
- controls to ensure that outage work was not impacting the ability of the operators to operate the spent fuel pool cooling system.
- controls over activities that could affect reactivity.
- maintenance of secondary containment as required by TS.
- licensee identification and resolution of problems related to RFO activities.

This inspection does not constitute a refueling outage sample in the current inspection report. This refueling outage sample will be credited in the second quarter 2009 Inspection Report since most major outage activities will be conducted during that quarter.

#### b. Findings

No findings of significance were identified.

## 1R22 Surveillance Testing (71111.22)

### .1 Surveillance Testing

#### a. Inspection Scope

The inspectors reviewed the test results for the following activities to determine whether risk-significant systems and equipment were capable of performing their intended safety function and to verify testing was conducted in accordance with applicable procedural, TS and inservice testing (IST) requirements:

- 2A Diesel Generator Auto-Trip Bypass Surveillance (Routine);
- 2B AF Pump After Failure of Auxiliary Oil Pump to Auto-Stop (Routine);
- 1B Diesel Generator Slave Relay Start and Semi-Annual Surveillance (Routine);
- 2B AF Pump After Identification of High Vibrations (Routine);
- 1A SI Pump Quarterly Surveillance and American Society of Mechanical Engineers (ASME) surveillance (IST); and
- Unit 1 and 2 RCS Point-to-Point Leakrate (RCS Leak Detection).

The inspectors observed in plant activities and reviewed procedures and associated records to determine the following:

- did preconditioning occur;
- were the effects of the testing adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- were acceptance criteria clearly stated, demonstrated operational readiness, and consistent with the system design basis;
- plant equipment calibration was correct, accurate, and properly documented;
- as-left setpoints were within required ranges; and the calibration frequency were in accordance with TSs, the UFSAR, procedures, and applicable commitments;
- measuring and test equipment calibration was current;
- test equipment was used within the required range and accuracy;
- applicable prerequisites described in the test procedures were satisfied;
- test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used;
- test data and results were accurate, complete, within limits, and valid;
- test equipment was removed after testing;
- where applicable for inservice testing activities, testing was performed in accordance with the applicable version of Section XI, ASME code, and reference values were consistent with the system design basis;
- where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable;
- where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure;
- where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished;
- prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test;
- equipment was returned to a position or status required to support the performance of its safety functions; and
- all problems identified during the testing were appropriately documented and dispositioned in the CAP.

Documents reviewed are listed in the Attachment.

This inspection constituted four routine surveillance testing samples, one inservice testing sample, and one RCS leak detection inspection sample as defined in IP 71111.22, Sections -02 and -05.

b. Findings

No findings of significance were identified.

**2. RADIATION SAFETY**

**Cornerstone: Public Radiation Safety**

2PS1 Radioactive Gaseous And Liquid Effluent Treatment And Monitoring Systems (71122.01)

.1 Inspection Planning

a. Inspection Scope

The inspectors reviewed the configuration of the licensee's gaseous and liquid effluent processing systems to confirm that radiological discharges were properly mitigated, monitored, and evaluated with respect to public exposure. The inspectors reviewed the performance requirements contained in General Design Criteria 60 and 64 of Appendix A to 10 CFR Part 50 and in the licensee's Radiological Effluent Technical Specifications (RETS) and Offsite Dose Calculation Manual (ODCM). The inspectors also reviewed any abnormal radioactive gaseous or liquid discharges and any conditions since the last inspection when effluent radiation monitors were out-of-service to verify that the required compensatory measures were implemented. Additionally, the inspectors reviewed the licensee's quality control program to verify that the radioactive effluent sampling and analysis requirements were satisfied and that discharges of radioactive materials were adequately quantified and evaluated.

The inspectors reviewed each of the radiological effluent controls program requirements to verify that the requirements were implemented as described in the licensee's RETS. For selected system modification (since the last inspection), the inspectors reviewed changes to the liquid or gaseous radioactive waste system design, procedures, or operation, as described in the UFSAR and plant procedures.

The inspectors reviewed changes to the ODCM made by the licensee since the last inspection to ensure consistency was maintained with respect to guidance in NUREG-1301, 1302 and 0133 and Regulatory Guides 1.109, 1.21 and 4.1. If differences were identified, the inspectors reviewed the licensee's technical basis or evaluations to verify that the changes were technically justified and documented.

The inspectors reviewed the radiological effluent release report(s) for 2007 and 2008 in order to determine if anomalous or unexpected results were identified by the licensee, entered in the CAP, and adequately resolved.

The inspectors reviewed any significant changes in reported dose values from the previous radiological effluent release report, and the inspectors evaluated the factors which may have resulted in the change. If the change was not explained as being influenced by an operational issue (e.g., fuel integrity, extended outage, or major

decontamination efforts), the inspectors independently assessed the licensee's offsite dose calculations to verify that the licensee's calculations were adequately performed and were consistent with regulatory requirements.

The inspectors reviewed the licensee's correlation between the effluent release reports and the environmental monitoring results, as provided in Section IV.B.2 of Appendix I to 10 CFR Part 50.

Documents reviewed are listed in the Attachment.

This inspection constitutes one sample as defined by IP 71122.01-5.

b. Findings

No findings of significance were identified.

.2 Onsite Inspection

a. Inspection Scope

The inspectors performed a walkdown of selected components of the gaseous and liquid discharge systems (e.g., gas compressors, demineralizers and filters (in use or in standby), tanks, and vessels) and reviewed the current system configuration with respect to the description in the UFSAR. The inspectors evaluated temporary waste processing activities, system modifications, and the equipment material condition. For equipment or areas that were not readily accessible, the inspectors reviewed the licensee's material condition surveillance records, as applicable. The inspectors reviewed any changes that were made to the liquid or gaseous waste systems to verify that the licensee adequately evaluated the changes and maintained effluent releases as low-as-is-reasonably-achievable.

During system walkdowns, the inspectors assessed the operability of selected points of discharge effluent radiation monitoring instruments and flow measurement devices. The effluent radiation monitor alarm set point values were reviewed to verify that the set points were consistent with RETS/ODCM requirements.

For effluent monitoring instrumentation, the inspectors reviewed documentation to verify the adequacy of methods and monitoring of effluents, including any changes to effluent radiation monitor set-points. The inspectors evaluated the calculation methodology and the basis for the changes to verify the adequacy of the licensee's justification.

The inspectors observed the licensee's sampling of liquid and gaseous radioactive waste (e.g., sampling of waste steams) and observed selected portions of the routine processing and discharge of radioactive effluents if those activities occurred during the onsite inspection. Additionally, the inspectors reviewed several radioactive effluent discharge permits, assessed whether the appropriate treatment equipment was used and whether the radioactive effluent was processed and discharged in accordance with RETS/ODCM requirements, including the projected doses to members of the public.

The inspectors interviewed staff concerning effluent discharges made with inoperable (declared out-of-service) effluent radiation monitors to determine if appropriate

compensatory sampling and radiological analyses were conducted at the frequency specified in the RETS/ODCM. For compensatory sampling methods, the inspectors reviewed the licensee's practices to determine if representative samples were obtained and if the licensee routinely relied on the use of compensatory sampling in lieu of adequate system maintenance or calibration of effluent monitors.

The inspectors reviewed surveillance test results for nonsafety-related ventilation and gaseous discharge systems (high efficiency particulate air and charcoal filtration) to verify that the systems were operating within the specified acceptance criteria. In addition, the inspectors assessed the methodology the licensee used to determine the stack/vent flow rates to verify that the flow rates were consistent with the RETS/ODCM.

The inspectors reviewed the licensee's program for identifying any normally non-radioactive systems that may have become radioactively contaminated to determine if evaluations (e.g., 10 CFR 50.59 evaluations) were performed per IE Bulletin 80-0. The inspectors did not identify unidentified contaminated systems that may have been unmonitored discharge pathways to the environment.

The inspectors reviewed instrument maintenance and calibration records (i.e., both installed and counting room equipment) associated with effluent monitoring and reviewed quality control records for the radiation measurement instruments. The inspectors performed this review to identify any degraded equipment performance and to assess corrective actions, as applicable.

The inspectors reviewed the radionuclides that were included by the licensee in its effluent source term to determine if all applicable radionuclides were included (within detectability standards) in the licensee's evaluation of effluents. The inspectors reviewed waste stream analyses (10 CFR Part 61 analyses) to determine if hard-to-detect radionuclides were also included in the source term analysis.

The inspectors reviewed a selection of monthly, quarterly, and annual dose calculations to ensure that the licensee had properly demonstrated compliance with 10 CFR Part 50, Appendix I, and RETS dose criteria.

The inspectors reviewed licensee records to identify any abnormal gaseous or liquid tank discharges (e.g., discharges resulting from misaligned valves, valve leak-by, etc.) to determine if the licensee had implemented the required actions. The inspectors determined if abnormal discharges were assessed and reported as part of the Annual Radioactive Effluent Release Report consistent with Regulatory Guide 1.21.

The inspectors reviewed the licensee's effluent sampling records (sampling locations, sample analyses results, flow rates, and source term) for radioactive liquid and gaseous effluents to verify that the licensee's information satisfied the requirements of 10 CFR 20.1501.

Documents reviewed are listed in the Attachment.

This inspection constitutes one sample as defined by IP 71122.01-5.

b. Findings

No findings of significance were identified.

.3 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, Licensee Event Reports (LERs), and Special Reports related to the radioactive effluent treatment and monitoring program since the last inspection to determine if identified problems were entered into the CAP for resolution. The inspectors also assessed whether the licensee's self-assessment program was capable of identifying repetitive deficiencies or significant individual deficiencies in problem identification and resolution. The inspectors reviewed corrective action reports from the radioactive effluent treatment and monitoring program since the previous inspection, interviewed staff, and reviewed documents to determine if the following activities were conducted in an effective and timely manner commensurate with their importance to safety and risk:

- initial problem identification, characterization, and tracking;
- disposition of operability/reportability issues;
- evaluation of safety significance/risk and priority for resolution;
- identification of repetitive problems;
- identification of contributing causes;
- identification and implementation of effective corrective actions;
- resolution of NCVs tracked in the corrective action system; and
- implementation/consideration of risk significant operational experience feedback and ensuring problems were identified, characterized, prioritized, entered into a corrective action, and resolved.

Documents reviewed are listed in the Attachment.

This inspection constitutes one sample as defined by IP 71122.01-5.

a. Findings

No findings of significance were identified.

.4 Review of Blowdown Line Operations and Tritium Remediation Efforts

a. Inspection Scope

The inspectors continued to monitor the licensee's activities resulting from historical inadvertent leaks of tritiated liquid from the blowdown line. The inspectors continued to accompany licensee employees and contractors during their collection of water samples at 23 monitoring locations of interest. The inspectors verified by direct observation that the water samples were being taken from the locations specified, that proper sampling protocols were followed, and that split samples were properly obtained and labeled. The inspectors took direct custody of the split samples and maintained a chain of custody as the samples were sent to the NRC's contract laboratory. The inspectors also reviewed the results of September 16, 17, and 22, 2008, split samples to ensure that the results

from the licensee's and NRC's contract laboratories matched within normal statistical variance.

Documents reviewed were listed in the Attachment.

This inspection does not constitute a sample as defined in IP 71122.02-5.

b. Findings

No findings of significance were identified.

4. **OTHER ACTIVITIES**

**Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Physical Protection**

4OA1 Performance Indicator Verification (71151)

.1 Unplanned Scrams per 7000 Critical Hours

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Scrams per 7000 Critical Hours performance indicator (PI) for Unit 1 and Unit 2 for the period from January 2008 through December 2008. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports and NRC Inspection Reports for the period of January 2008 through December 2008 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment.

This inspection constituted two unplanned scrams per 7000 critical hours sample as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

.2 Unplanned Scrams with Complications

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Scrams with Complications performance indicator for Unit 1 and Unit 2 for the period from January 2008-December 2008. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports



and NRC Integrated Inspection Reports for the period of January 2008 through December 2008 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment.

This inspection constituted two unplanned scrams with complications sample as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

.3 Unplanned Transients per 7000 Critical Hours

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Transients per 7000 Critical Hours performance indicator for Unit 1 and Unit 2 for the period from January 2008 through December 2008. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, maintenance rule records, event reports and NRC Integrated Inspection Reports for the period of January 2008 through December 2008 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment.

This inspection constituted two unplanned transients per 7000 critical hours sample as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review of Items Entered Into the CAP

a. Inspection Scope

As part of the various baseline inspection procedures 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 CAP at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Attributes reviewed included: the complete and accurate identification of the problem; that timeliness was commensurate with the safety significance; that evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root

causes, extent of condition reviews, and previous occurrences reviews were proper and adequate; and that the classification, prioritization, focus, and timeliness of corrective actions were commensurate with safety and sufficient to prevent recurrence of the issue. Minor issues entered into the licensee's CAP as a result of the inspectors' observations are included in the Attachment.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure they were considered an integral part of the inspections performed during the quarter and documented in Section 1 of this report.

b. Findings

No findings of significance were identified.

.2 Daily CAP Reviews

a. Inspection Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's CAP. This review was accomplished through inspection of the station's daily condition report packages.

These daily reviews were performed by procedure as part of the inspectors' daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings of significance were identified.

.3 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment issues, but also considered the results of daily inspector CAP item screening discussed in Section 4OA2.2 above, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the 6 month period of July 2008 through December 2008, although some examples expanded beyond those dates where the scope of the trend warranted.

The inspectors identified a potential trend in the number of sinkholes in the owner controlled area. The inspectors reviewed the licensee's program for mitigating corrosion in buried piping and raw water systems and the corresponding database identifying the location and susceptibility of underground and raw water piping. The inspectors' review identified that most sinkholes were of a small size, several feet across and several

inches deep. Based on the data obtained, there did not appear to be a trend in the location, size, or cause of the sinkholes onsite.

The review also included issues documented outside the normal CAP in major equipment problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self assessment reports, and Maintenance Rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's CAP trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

Documents reviewed are listed in the Attachment.

This review constituted one semi-annual trend inspection sample as defined in IP 71152-05.

b. Findings

No findings of significance were identified.

.4 Selected Issue Follow-up Inspection: Solid State Protection System Cards

a. Inspection Scope

The inspectors reviewed Information Notice 2009-03, "Solid State Protection System Card Failure Results in Spurious Safety Injection Actuation and Reactor Trip." Prior SSPS card failures at Braidwood were identified through inspector review of the licensee's CAP database. The inspectors reviewed the circumstances of identified SSPS card failures to ensure appropriate corrective actions were taken, including review of Apparent Cause Reports. The inspectors also reviewed the receipt inspection process and testing methodologies for SSPS cards.

Documents reviewed are listed in the Attachment.

The review constituted one in-depth problem identification and resolution sample as defined in IP 71152-05.

b. Findings

No findings of significance were identified.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153)

.1 (Closed) LER 05000456/2008-001-00: TS Non-Compliance Due to Inadequate Design of Auxiliary Feedwater (AF) Tunnel Access Covers Causing AF Valves Within the Tunnels to be Inoperable

This issue was initially discussed in Inspection Report 05000456/2008003; 05000457/2008003, Section 1R15, as Unresolved Item (URI) 05000456/2008003-03; 05000457/2008003-03. The issue was dispositioned in Inspection Report 05000456/2008005; 05000457/2008005, Section 1R15.b.1, as an NCV of 10 CFR 50,

Appendix B, Criterion XVI, for the failure to promptly identify and correct conditions adverse to quality regarding the design of the AF tunnel hatch covers. The LER was reviewed and determined to be completed in accordance with NRC regulations. Based on the issuance of NCV 05000456/2008005-03; 05000457/2008005-03, the associated URI and this LER are closed.

This event follow-up review constituted one sample as defined in IP 71153-05.

.2 (Closed) LER 05000457/2008-001-00: 2A Essential Service Water Train Inoperable Due to Strainer Fouling From Bryozoa Deposition and Growth

This event, which occurred on September 2, 2008, was previously discussed in Inspection Report 05000456/2008004; 05000457/2008004, Section 1R22.4 as URI 05000456/2008004-04; 05000457/2008004-04. Based on the results of a 1A SX pump ASME surveillance, and other abnormal conditions in the circulating water (CW) and SX systems, the licensee identified bryozoan colonies had accumulated in the forebays that supply water to the CW and SX systems.

Beginning on August 17, 2008, the licensee identified anomalies in the CW and SX systems. On September 2, 2008, during the 1A SX pump ASME surveillance, entrainment of bryozoans on the SX pump strainer caused differential pressure across the strainer to rise beyond 20 psid. The 1A SX pump was declared inoperable. On September 4, 2008, the licensee ran the 2A SX pump to verify that the SX pump strainers could be manually backwashed in the event of a loss of power. Operators were unable to manually backwash the strainer and the 2A SX pump was declared inoperable. The licensee identified 2-3 feet of bryozoa in the Unit 1 and Unit 2 forebays. Operability was restored after the licensee cleaned the strainers and circulating water forebays.

Based on the as-found forebay conditions, the licensee subsequently determined that the 2A SX pump should have been declared inoperable on September 2, at the same time the 1A SX pump was declared inoperable. Since the 2A SX pump operability was not restored until September 6, 2008, the TS 3.7.8, Condition A, 72 hour completion time was exceeded. Based on that determination, the licensee submitted LER 05000457/2008-001-00 on December 8, 2008.

Subsequent investigation by the licensee has provided additional information regarding the past operability of the 1A and 2A SX pumps. Based on the new information, the licensee submitted a supplemental LER, 05000457/2008-001-01, on April 9, 2009.

The inspectors have completed their review of the initial LER and determined the document was a factual description of events. The inspectors have not completed their review of the supplemental LER and will document that review at a later date. Documents reviewed as part of this inspection are listed in the attachment. The LER was reviewed and determined to be completed in accordance with NRC regulations. This LER is closed; however, the associated URI and the supplemental LER remain open.

This event follow-up review constituted one sample as defined in IP 71153-05.

.3 (Closed) LER 05000457/2008-002-00: Reactor Trip on Unit Auxiliary Transformer 241-1 Sudden Pressure Relay Actuation Due to 2C Heater Drain Pump Motor Electrical Fault

This event, which occurred on December 27, 2008, was previously discussed in Inspection Report 05000456/2008005; 05000457/2008005, Section 4OA3. On December 27, 2008, the Unit 2 reactor automatically tripped from 100 percent reactor power due to a main turbine trip while above 30 percent reactor power. The main turbine tripped due to the actuation of the unit auxiliary transformer (UAT) 241-1 sudden pressure relay (SPR), which caused the main generator to trip. At the time of the reactor trip, the 2C heater drain pump tripped on overcurrent. Subsequent investigation identified the cause of the reactor trip to be a phase to phase fault on the 2C heater drain pump motor, which actuated the UAT 241-1 SPR and tripped the main generator and Unit 2 reactor.

Introduction: A Green finding was self-revealed due to inadequate procedural guidance on re-terminating motor leads. On December 27, 2008, excessively long motor leads caused a phase to phase overcurrent trip of the 2C heater drain pump and subsequent Unit 2 reactor trip.

Description: In April and May 2008, the 2C heater drain pump motor was refurbished under Work Order 1021367. On April 1, Braidwood maintenance personnel de-terminated the motor and shipped the motor to an offsite contractor for refurbishment. The motor was then returned to Braidwood and onsite contract personnel continued the on-site refurbishment work, which included re-terminating the motor leads on May 23.

Step 7.2 of the work package instructed personnel to re-terminate the 6.9kV motor leads in accordance with applicable steps of Procedure BwHP 4006-008, Revision 13, "Repairing, De-Terminating, Terminating, Splicing, Taping, Cable Jacket Repair, and Application of Raychem Kit on Cable." However, Procedure BwHP 4006-008 did not have applicable steps for re-terminating 6.9kV motor leads. When it was identified that applicable steps for re-terminating the motor did not exist, onsite contractor personnel performed the task as skill of the craft, which was considered by the licensee to be an acceptable work practice.

The contractor that refurbished the motor left the motor leads longer than necessary following refurbishment to ensure adequate lead length when the motor was re-terminated. When the onsite contractor personnel re-terminated the motor, they left approximately 2 feet of extra lead length and secured it with tie-wraps, rather than the cutting the excess lead length to several inches, which is the standard excess lead length. Following re-termination, the motor was found to be rotating backwards. Braidwood maintenance personnel corrected the rotation problem but did not question the excess motor lead length. Once the pump was returned to service, the phase A motor lead shifted and came in contact with the phase C bus bar. Over time, vibration caused the motor lead to rub through the bus bar insulation, which resulted in a phase A to phase C fault on December 27, 2008.

Analysis: The inspectors determined that inadequate procedural guidance resulting in a reactor trip was a performance deficiency. The inspectors reviewed IMC 0612, Appendix B, Issue Screening, and determined the finding was more than minor because it impacted the procedure quality attribute of the Initiating Events Cornerstone objective

to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations.

The inspectors performed a Phase 1 SDP review of this finding using the guidance provided in IMC 0609, Attachment 4, "Initial Screening and Characterization of Findings." In accordance with Table 3b, "SDP Phase 1 Screening Worksheet for Initiating Events, Mitigating Systems, and Barriers Cornerstone," the finding affected the Initiating Events Cornerstone. The inspectors answered 'no' to the Transient Initiators question in the Initiating Events Cornerstone Column of IMC 0609, Attachment 4, Table 4a, and determined the issue to be of very low safety significance (Green). There is no cross cutting aspect associated with this finding because the development of the inadequate procedure did not reflect current performance. (Section 4OA3.3)

Enforcement: The inadequate portion of Procedure BwHP 4006-008 governs activities on equipment that is not used to prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public. Therefore, this finding does not represent a violation of regulatory requirements and enforcement action does not apply. This issue was entered into the licensee's corrective action program as IR 860458. (FIN 05000457/2009002-02)

The LER was reviewed and determined to be completed in accordance with NRC regulations. This LER is closed.

This event follow-up review constituted one sample as defined in IP 71153-05.

.4 (Closed) LER 05000456/2008-002-00: Unit 1 Containment Isolation Valve 1PS229B De-energized Open Instead of Closed per TS 3.6.3

This issue, which occurred on December 19, 2008, was previously discussed in Inspection Report 05000456/2008005; 05000457/2008005, Section 4OA7. The issue was dispositioned in that Inspection Report as a licensee-identified violation of TS 3.6.3 Condition A. This LER is closed.

This event follow-up review constituted one sample as defined in IP 71153-05.

4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours and included:

- multiple tours of operations within the central and secondary security alarm stations;
- owner controlled area and protected area access control posts;

- other security officer posts including the ready room and compensatory posts; and
- security equipment log review.

The inspectors also reviewed a report of the results of a survey of the site security organization relative to its safety conscious work environment. The inspectors considered whether the surveys were conducted in a manner that encouraged candid and honest feedback. The results were reviewed to determine whether adequate number of staff responded to the survey. The inspectors also reviewed Exelon's self-assessment of the survey results and verified that any issues or areas for improvement were entered into the CAP for resolution.

These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status review and inspection activities.

b. Findings

No findings of significance were identified.

.2 (Closed) NRC Order EA-03-009; Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors

On February 11, 2003, the NRC issued Order EA-03-009 that imposes specific interim inspection requirements of the reactor pressure vessel head and associated penetration nozzles at pressurized water reactors. On February 22, 2004, the Order was revised to address revisions to bare metal visual inspections, penetration nozzle inspection coverage, flexibility in combination of non-destructive examination methods, flaw evaluation, and requirements for plants which have replaced their RPV head. The requirements of the Order were expected to remain in effect pending long-term resolution of RPV head penetration inspection requirements.

10 CFR 50.55a(g)(6)(ii)(D), Reactor Vessel Head Inspections, was revised on September 10, 2008, (published in Federal Register 52734) with an implementation date no later than December 31, 2008. The Order was deemed to be withdrawn when the regulation was implemented. Therefore this Order is closed.

40A6 Management Meetings

.1 Exit Meeting Summary

On April 17 2009, the inspectors presented the inspection results to Mr. B. Hanson and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

.2 Interim Exit Meetings

Interim exits were conducted for:

- On February 20, 2009, the inspectors presented the inspection results of an unresolved item from the Fall 2008 Evaluation of Changes, Tests, or Experiments and Permanent Plant Modifications inspection to the Plant Manager, Mr. L. Coyle, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.
- On February 27, 2009, the inspectors presented the results of the Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems inspection with the Plant Manager, Mr. L. Coyle, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

The inspectors confirmed that potential report input discussed was either not considered proprietary, or, if there was proprietary input, licensee personnel identified any documents, materials, or information provided during the inspection that were considered proprietary. Proprietary materials reviewed during the inspection were returned to the licensee.

ATTACHMENT: SUPPLEMENTAL INFORMATION



## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

B. Hanson, Site Vice President  
L. Coyle, Plant Manager  
K. Aleshire, Emergency Preparedness Manager  
G. Dudek, Site Training Director  
R. Gadbois, Maintenance Director  
D. Gullott, Regulatory Assurance Manager  
D. Gustafson, Design Engineering Manager  
J. Knight, Nuclear Oversight Manager  
T. McCool, Operations Director  
J. Moser, Radiation Protection Manager  
T. Schuster, Chemistry Manager  
M. Smith, Engineering Director

#### Nuclear Regulatory Commission

R. Skokowski, Chief, Reactor Projects Branch 3

## LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

### Opened

05000457/2009002-01	NCV	Safety Injection Pipe Support Deficiencies (Section 1R17.1.b)
05000457/2009002-02	FIN	Reactor Trip On Unit Auxiliary Transformer 241-1 Sudden Pressure Relay Actuation Due To 2C Heater Drain Pump Motor Electrical Fault (Section 4OA3.2)

### Closed

05000457/2009002-01	NCV	Safety Injection Pipe Support Deficiencies (Section 1R17.1.b)
05000457/2009002-02	FIN	Reactor Trip On Unit Auxiliary Transformer 241-1 Sudden Pressure Relay Actuation Due To 2C Heater Drain Pump Motor Electrical Fault (Section 4OA3.2)
05000457/2008008-01	URI	Additional Information Needed To Determine Adequacy Of Safety Injection Unit 2 SI06 Pipe Supports
05000456/2008003-03; 05000457/2008003-03	URI	AFW Tunnel Hatches Margins of Safety
05000456/2008-001-00	LER	Non-Compliance Due To Inadequate Design Of AF Tunnel Access Covers Causing AF Valves Within The Tunnel To Be Inoperable
05000457/2008-001-00	LER	2A Essential Service Water Train Inoperable Due to Strainer Fouling From Bryozoa Deposition And Growth
05000456/2008-002-00	LER	Unit 1 Containment Isolation Valve 1PS229B De-energized Open Instead of Closed per TS 3.6.3
05000457/2008-002-00	LER	Reactor Trip On Unit Auxiliary Transformer 241-1 Sudden Pressure Relay Actuation Due To 2C Heater Drain Pump Motor Electrical Fault
EA-03-009	ORD	Establishing Interim Inspection Requirements for Reactor Vessel Heads at Pressurized Water Reactors

### Discussed

05000456/2008005-03; 05000457/2008005-03	NCV	Inadequate Corrective Action for Failure to Promptly Correct AF Tunnel Feedwater Tunnel Hatch Cover Design Deficiencies
05000456/2008004-04; 05000457/2008004-04	URI	Bryozoa Infestation at the Lake Screenhouse Circulating Water
05000457/2008001-01	LER	2A Essential Service Water Train Inoperable Due to Strainer Fouling From Bryozoa Deposition And Growth

## LIST OF DOCUMENTS REVIEWED

The following is a partial list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspector reviewed the documents in their entirety, but rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

### 1R01 Adverse Weather Protection

- IR 866485; Snow Found in VA Plenums; January 14, 2009
- IR 866980; Potential Frozen FP Piping (1SH15AY); January 15, 2009
- IR 867388; Turbine Deck Temperatures As Low As 20 degrees F Due to Inop Heaters & Windows; January 15, 2009
- IR 867539; U1 Non ESF (6.9KV) Switchgear Room at 30 Degrees F - 1VX07Y; January 15, 2009
- IR 866667; Outside Air Louvers in U1 Heater Drain Vent Fan Room Are Not Closed; January 14, 2009
- Drawing M-50; Diagram of Diesel fuel Oil Unit 1; June 24, 1976
- Drawing M-50; Diagram of Diesel fuel Oil Units 1 & 2; June 24, 1976
- Drawing M-52; Diagram of Fire Protection Units 1 & 2; July 19, 1978

### 1R04 Equipment Alignment

- BwOP RH-E1; Electrical Lineup - Unit 1 Operating; Revision 6
- BwOP RH-M1; Operating Mechanical Lineup - Unit 1 1A RH Train; Revision 12
- BwOP SX-E1, Electrical Lineup - Unit 1 Essential Service Water System Operating, Rev. 7
- BwOP SX-M1, Operating Mechanical Lineup Unit 1, Rev. 25
- 1BwOSR 3.7.8.1, Unit One Essential Service Water System Surveillance, Rev. 15

### 1R05 Fire Protection

- Braidwood Station Pre-Fire Plans, Fuel Handling Building – Elevation 401'
- Braidwood Station Pre-Fire Plans, Fuel handling Building - Elevation 426' and New Fuel Unloading Area at Elevation 411'

### 1R07A Heat Sink Review

- EC 357161; HX Visual Inspection Acceptance Criteria
- Unit 0 CC HX Eddy Current Test Results; February 2009
- ER-AA-340-1002, Revision 3, Attachment 1; HX/Component Data Sheet, March 11, 2009
- IR 882927; OCC01A: Preventatively Plugged 9 Tubes Per Eddy Current Test; February 20, 2009

### 1R12 Maintenance Effectiveness

- IR 849790, MRule FF Determination Inadequate for Rx Trip Breaker; November 26, 2008
- IR 819918, U-2 Rx Trip Bkr Failed to Reclose During Surv.; September 19, 2008
- BwAR 1-BP-3.1, Rx Trip P4, Rev. 1
- 1BwEP ES-0.1, Reactor Trip Response Unit 1, Rev. 200
- 1BwFR-H.1, Response to Loss of Secondary Heat Sink Unit 1, Rev. 200

- 1BwST-3, Heat Sink, Rev. 200
- Apparent Cause Report, Unit 2B Reactor Trip Breaker Failed to Re-close During SSPS Surveillance; Reactor Trip Breaker 1RD05E-RTA failed to Close During SSPS Testing; February 3, 2009
- Maintenance Rule Functional Failure Review - IR 819918: October 14, 2008
- Maintenance Rule Evaluation - Rod Drive System, September 2008
- Maintenance Rule Evaluation - Rod Drive system, December, 2008
- Maintenance Rule Evaluation - Engineered Safety Features Actuation System, September 2008
- Maintenance Rule Evaluation - Engineered Safety Features Actuation System, December 200

#### 1R13 Maintenance Risk Assessments And Emergent Work Control

- IR 869303; Secured 2B AF PP During Test - Aux LO PP Did Not Shutdown; January 21, 2009
- IR 869819; 2B AF Pump Monthly Surveillance Performance and Operability; January 21, 2009
- MA-AA-716-004; 2B AF PP Oil System; Revision 7
- 2BwOSR 3.7.5.4-2; Unit 2 Diesel Driven Auxiliary Feedwater Pump Surveillance; Revision 18
- WC-MW-114; Diesel Driven Auxiliary FW Pump Surveillance; Revision 0
- WO 01195323 01; U2 Diesel Driven Auxiliary FW Pump Monthly Surveillance; January 21, 2009
- 2B AF Pump Unavailable January 2009 (Unplanned Entry) Protected Equipment
- Amendment No. 127 to Braidwood Technical Specifications; May 22, 2003
- Protected Equipment List, 2A SX Pump Work Windows with 2C WS Pump and 0B VA Non-accessible Plenum Out of Service; February 2009
- BwAP 1110-3, Attachment 3, Pre-Evaluated Plant Barrier Matrix, Rev. 16
- PBI No. 11572, Plant Barrier Impairment Permit for Flood Seal 1SXFSO1-2 Removal; February 6, 2009
- PBI No. 11923, Plant Barrier Impairment Permit for Flood Seal 1SXFSO1-3 Removal; February 6, 2009
- PBI No. 11571, Plant Barrier Impairment Permit for Flood Seal 1SXFSO1-5 Removal; February 6, 2009

#### 1R15 Operability Evaluations

- IR 884516; Discrepancy of Relay Setpoint VS Design Range for 2AF013-K11; February 24, 2009
- IR 892049; NRC Questions Re: 50.59 for Fuel Handling Building Crane Runway Extension; March 12, 2009
- Drawing 20E-1-4040AF12; Schematic Diagram AF Pump 1B (Diesel-Driven) Engine Startup Panel 1AF01J; January 12, 1979
- Drawing 20E-2-4040AF12; Schematic Diagram AF Pump 1B (Diesel-Driven) Engine Startup Panel 2AF01J; September 2, 1980
- WO 776739-01, 1PS-DG080B DG 1B Turbo Lube Oil Pressure Switch Cal.; September 21, 2006
- IR 873244, 1T-DG247B Suspect in Causing Low Discharge Temperatures; January 28, 2009
- IR 872954, Turbo Lube Oil Low Pressure During 1B DG Run; January 28, 2009
- BwOP DG-11, Diesel Generator Startup, Rev. 35
- Prompt Investigation for IR 872954, Turbo Lube Oil Low Pressure During 1B DG Run; January 29, 2009
- Drawing M-152, Manufacturers Supplemental Diagram of Diesel Generator Jacket Water Schematic, Units 1 & 2, Rev. U

- Letter from J. Home to Cooper-Bessemer Owners Group Technical Committee, Lube Oil and Jacket Water Temperatures KSV nuclear Standby Engines; September 13, 1995

#### 1R17 Evaluation of Changes, Tests, or Experiments and Permanent Plant Modifications

- Calculation No. 13.2.29; Structural Calculations for the following Mechanical Component Supports 2SI06309X, 2SI06310X, 2SI06311G, 2SI06316X, 2SI06318X, 2SI06328X, 2SI06335X, 2SI06336X, 2SI06337X, 2SI06340S, 2SI06342X, 2SI06345X, 2SI06351X, 2SI06358X, 2SI06360X; Revision 2
- Calculation No. BRW-97-0827-M; Piping Eval for Lead Shielding Installation on Subsystem 2SI06 Piping per Temp Lead Shielding Request TSR 95-153, 96-018/045/053 & 97-120; Revision 0
- Calculation No. BRW-97-0827-M; Piping Eval Lead Shielding on Subsystem 2SI06; Minor Revision 0A
- CC-AA-309-1011; General Station Piping Analysis; Revision 2
- IR 00816677; NRC Mod/50.59 Insp 2SI06 Piping Subsystem Support; September 11, 2008
- BwOP SI-1; Safety Injection System Startup; Revision 19
- 1BwOSR 5.5.8.SI-10A; Group A IST Requirements for 1A SI Pump (1S101PA); Revision 0
- WO 01189386 01; ASME Surveillance Requirement for 1A SI Pump; February 5, 2009
- OP-AA-108-115; Operability Determinations (CM-1); Revision 6
- Operability Evaluation No. 08-007; Degraded Piping Subsystem 2SI06 Supports; September 16, 2008
- Regulatory Guide 1.84; Design & Fab Code Case Acceptability ASME Sect III Division I; Revision 24

#### 1R19 Post Maintenance Testing

- IR 156533; Degraded Battery Charger Due to Loose Connecting Bolt
- IR 895814; Misinterpretation of Value Causes Unnecessary Resource Load; March 21, 2009
- IR 895839; Charger Float Voltage Pot Won't Respond; March 21, 2009
- IR 896342; Lack of Procedure Guidance for AF Battery, Charger OOS; March 21, 2009
- Clearance 00072627 Unit 2; 2B AF Pump Battery Charger #2B; March 23, 2009
- MA-AA-716-004; Troubleshooting Log 2AF01EB-1; Revision 7
- OP-AA-109-101; Supervision Clearance Acceptance/Release Checklist; Revision 3
- Master Materials Catalog 39831
- Master Materials Catalog 9866
- Material Request 01381735
- WO 01006137-06; 24 Volt AF Bank 5 Year Capacity Test; March 26, 2009
- BwHP 4006-008; Repairing, Determinating, Terminating, Splicing, Taping, Cable Jacket Repair and Application of Raychem Kit on Cable; Revision 15
- MTL Request 01861475; EM Charger Float Voltage Pot
- Drawing 20E-2-4469H; Internal Wiring Diagram Battery Charger 2AF01EA-1 & 2AF01EB-1 Part 1; September 10, 1985
- Drawing 20E-2-4469J; Internal Wiring Diagram Battery Charger 2AF01EA-1 & 2AF01EB-1 Part 2; September 10, 1985
- Drawing 20E-0-3322; Electrical Installation Auxiliary Building Plan Elevation 383-0, Cols. L-Q 15-21; October 14, 1980
- Drawing 20E-2-4030AF02; Schematic Diagram Auxiliary Building Feedwater Pump 2B (Diesel Driven) 2AF01PB; September 2, 1980
- Drawing 20E-2-4030AF12; Schematic Diagram Auxiliary Building Pump 2B (Diesel-Driven) Engine Startup Panel 2AF01J; September 2, 1980

- Drawing 20E-4008Y; Key Diagram 480V Auxiliary Building ESF MCC 232X3 (2AP24E); May 31, 1978

### 1R22 Surveillance Testing

- IR 866770; Elevated Dose Rates in Radwaste Inner Truck Bay and Dock Area; January 14, 2009
- IR 866788; 2A DG L.O. Temp (2TE-DG036A) High During Run; January 14, 2009
- IR 867033; 2A DG 5L Cylinder Temperature Indication Varies; January 14, 2009
- IR 895654; Increasing Vibration on 6V Point on 2AF01PB; March 20, 2009
- WO 01031301 01; 2A DG Bypass of Automatic Trips Surveillance; January 14, 2009
- WO 01195328 01; OP IST-2A DG Operability Monthly; January 15, 2009
- 1BwOSR 3.4.13.1; Unit One Reactor Coolant System Water Inventory Balance Surveillance, Rev 22
- 2BwOSR 3.8.1.2-1; 2A DG Operability Surveillance; Revision 25
- 2BwOSR 3.8.1.13-1; 2A DG Bypass of Automatic Trips Surveillance; Revision 7
- WO 01214127 01; OP Diesel Driven AF PP Monthly; March 24, 2009
- WO 1198655-01, Unit One 1B Diesel Generator Operability Surveillance, dated 1/28/09
- WO 1181421-01, Unit One ESFAS Instrumentation Slave Relay Surveillance, dated 1/28/09

### 2PS1 Radioactive Gaseous And Liquid Effluent Treatment And Monitoring Systems

- IR 732647; North Oil Separator Sample Results Higher Than Limit on Tritium; February 6, 2008
- IR 724596; Liquid Release Early Termination; January 19, 2008
- IR 738955; IEMA Identified Historical Radiological Environmental Monitoring Data Discrepancies; February 15, 2008
- IR 754914; Nuclear Oversight Identifies Work Package Closures Lack Rigor; August 15, 2007
- IR 755289; Nuclear Oversight Identifies Radiological Effluent Factors Not Trended for Offsite Dose Calculation Manual; March 27, 2008
- IR 761706; RETS 2.1-1A Unplanned Entry Due to Loss of Sample Flow OPR5J
- IR 765269; 2PR02J Loss of Sample Flow; April 19, 2008
- IR 771232; Unplanned Limiting Condition for Operation Entered for Volume Control Radiation Monitor (OPR33J); May 2, 2008
- IR 773067; Unit 2 Gas Effluent dose Projection Exceeds 0.3 millirem; May 8, 2008
- IR 775616; OPR02J Tripped Moments After Starting a Release; May 14, 2008
- IR 781700; 2PR02J Unexpected Loss of Flow; June 1, 2008
- IR 796534; Large Amount of Sludge Left in West Lagoon Post Cleaning; July 15, 2008
- IR 808953; Vacuum Breaker 1 Weekly Composite Sample Not Valid; August 18, 2008
- IR 815407; TR Lagoons Have a Lot of Lime/Sludge; September 8, 2008
- IR 810671; Nuclear Oversight Identifies Deficiency in Chemistry Check-in Scope; August 25, 2008
- IR 846176; No Sample at Vacuum Breaker 1 Remediation Composite Sampler; November 17, 2008
- IR 846300; Vacuum Breaker Concern – Tritium Management; November 17, 2008
- IR 846351; Vacuum breaker 1 Composite Sampler Not in Operations Radiological Environmental Technical Specifications Procedure; November 18, 1008
- IR 859794; IDNS Questions Concerning Loss of Communications Alarms; December 23, 2008
- IR 870595; Nuclear Oversight Identifies Deficiencies in Environmental Check-in; January 23, 2009

- AT 795767; Check-in Self-Assessment: Radioactive Gaseous and Liquid Effluent Treatment and Monitoring; November 28, 2008
- BwOP CW-28; Operation of the Exelon Remediation Pond Pump and Vacuum Breakers Number 1 and Number 2 Remediation Pumps; Revision 16;
- BwOP GW-500T1; Approval for Gas Decay Tank Release; Revision 33;
- BwOP WX-526T1; Liquid Release Tank Release Form; October 4, 2008
- BwOP WX-526T1; Liquid Release Tank Release Form; November 27, 2008
- BwOP WX-526T1; Liquid Release Tank Release Form; November 28, 2008
- DRP 12-016; UFSAR Draft Revision Package – Revise UFSAR Table 11.2-5; October 15, 2007
- DRP 12-077; UFSAR Draft Revision Package – Revise UFSAR Section 11 and Tables 11.2-1, 11.2-4, 11.2-18, 11.2-25; September 24, 2008
- Permit Number 2008237; Gaseous Release Permit Report – Abnormal; June 4, 2008
- RP-AA-228; 10 CFR 75(g) and 10 CFR 72.20 Documentation Requirements; Revision 0
- WO 897058; 1PR28J Calibration of the Gaseous Effluent Radiation Monitor; August 14, 2007
- WO 894106; 0F-VA019 Calibration of Auxiliary Building Exhaust Tunnel Air Flow; July 12, 2007
- WO 939467; 0PR10J Calibration of the Liquid Effluent Radiation Monitor; March 24, 2008
- WO 945403; 2PR28J Calibration of the Gaseous Effluent Radiation Monitor; March 31, 2008
- WO 959377; 0F-VA020 Calibration of Auxiliary Building Exhaust Tunnel Air Flow; July 1, 2008
- WO 974402; 0PR01J Calibration of the Liquid Effluent Radiation Monitor; June 24, 2008
- BD-08-16-01 to 23; Tritium Sample Results Collection Date September 16, 17, and 22, 2008
- ML0834300099, Tritium Sample Results from American Radiation Services, Inc., October 31, 2008

#### 40A1 Performance Indicator Verification

- LS-AA-2010; Monthly Data Elements for NRC/WANO Unit/Reactor Shutdown Occurrences; January 2008 - December 2008
- LS-AA-2030; Monthly Data Elements for NRC Unplanned Power Changes per 7000 Critical Hours; January 2008 - December 2008

#### 40A2 Identification and Resolution of Problems

- IR 460074; Safety Concern - Sinkhole Under Walkway Blacktop; February 28, 2006
- IR 499107; Concern w/Sections of B/D Piping not Properly Inspected; June 12, 2006
- IR 564241; Need WO Made to Install Barricade per Safety Advisor Recommendation; December 1, 2006
- IR 621686; Sink Hole in Ground Under Blacktop Approximately 3 Feet Deep; April 25, 2007
- IR 634725; Safety - Sink Hole East of OFP811; May 29, 2007
- IR 674695; Sink Hole Identified in the OCA; September 17, 2007
- IR 686056; OFP590 Has Leak and is Leaking Onto Ground; October 17, 2007
- IR 696881; Gravel Washout Along Roadway to Lake Screen House; November 9, 2007
- IR 721198; Washout Areas Underneath EWS Fence; January 11, 2008
- IR 733633; Underground Leak Removed Soil from Under FIN Team Building; February 8, 2008
- IR 754139; Free Standing Junction Box 2JB005X Leaning Over; March 25, 2008
- IR 788846; Sink Hole Located on North End of North Oil Separator; June 20, 2008
- IR 814377; Sink Hole Discovered in VSO; September 9, 2008
- IR 817791; EED WR #00255649; September 15, 2008
- IR 836384; Washout Starting at STI 11; October 27, 2008

- IR 821393; Adverse Trend in Sinkholes Onsite; September 23, 2008
- IR 865143; Sink Hole in Parking Lot; January 10, 2009
- IR 876176; Trend on Sink Holes Identified from 2006 through 2008; February 4, 2009
- OP-AA-102-103; Operator Work-Around Program; Revision 002
- Drawing S-147; Plant Area Drainage Plan; December 14, 1998
- RS-02-173 Letter from Exelon to NRC; Request for Licensee Amendment to Add TS Surveillance Requirement for the diesel-Driven AF Pump; December 12, 2002
- IR 649405; OPEX – Braidwood Station Review of North Anna Reactor Trip Due to Spurious SI Signal From Failed SSPS Card; July 12, 2007
- Apparent Cause Evaluation 744304; 2PB-0546C/D Found Neither Circuit Would Trip; March 4, 2008

#### Miscellaneous

- Selected Control Room Log; January 1, 2008 - December 31, 2008



## LIST OF ACRONYMS USED

ADAMS	Agencywide Document Access Management System
AF	Auxiliary Feedwater
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CW	Circulating Water
ECCS	Emergency Core Cooling System
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Inspection Report
IR	Issue Report
IST	Inservice Testing
LER	Licensee Event Report
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
OA	Other Activities
ODCM	Offsite Dose Calculation Manual
OSP	Outage Safety Plan
PARS	Publicly Available Records
PI	Performance Indicator
RCS	Reactor Coolant System
RETS	Radiological Effluent Technical Specifications
RFO	Refueling Outage
RH	Residual Heat Removal
RWST	Reactor Water Storage Tank
SDP	Significance Determination Process
SI	Safety Injection
SPR	Sudden Pressure Relay
SX	Essential Service Water
TS	Technical Specification
TSR	Temporary Lead Shielding Request
UAT	Unit Auxiliary Transformer
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
WO	Work Order