



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

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

November 14, 2008

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

**SUBJECT: BRAIDWOOD STATION, UNITS 1 AND 2 NRC INTEGRATED INSPECTION
REPORT 05000456/2008004; 05000457/2008004**

Dear Mr. Pardee:

On September 30, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Braidwood Station, Units 1 and 2. The enclosed report documents the inspection results, which were discussed on October 9, 2008, with Mr. L. Coyle 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.

Based on the results of this inspection, two NRC-identified findings of very low safety significance were identified. Both findings involved a violation of NRC requirements. However, because of their very low safety significance, and because the issues were entered into your corrective action program, the NRC is treating the issues as Non-Cited Violations in accordance with Section VI.A.1 of the NRC Enforcement Policy.

If you contest the subject or severity of a Non-Cited Violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the 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, 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 accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be made 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), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/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 05000456/2008004; 05000457/2008004
w/Attachment: Supplemental Information

cc w/encl: Site Vice President - Braidwood Station
Plant Manager - Braidwood Station
Regulatory Assurance Manager - 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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Letter to C. Pardee from R. Skokowski dated November 14, 2008

SUBJECT: BRAIDWOOD STATION, UNITS 1 AND 2 NRC INTEGRATED INSPECTION
REPORT 05000456/2008004; 05000457/2008004

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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 05000456/2008004 and 05000457/2008004

Licensee: Exelon Generation Company, LLC

Facility: Braidwood Station, Units 1 and 2

Location: Braceville, IL

Dates: July 1 through September 30, 2008

Inspectors: B. Dickson, Senior Resident Inspector
A. Garmoe, Resident Inspector
J. Heath, Project Engineer
M. Mitchell, Health Physicist
M. Munir, Reactor Engineer
R. Ng, Resident Inspector
R. Winter, Reactor Engineer
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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 05000456/2008004, 05000457/2008004; 07/01/2008 - 09/30/2008; Braidwood Station, Units 1 & 2; Fire Protection.

This report covers a three-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. The inspectors identified one Green finding. The finding was considered a Non-Cited Violation (NCV) of NRC regulations. 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 finding of very low safety significance and associated NCV of Braidwood's License Condition 2.E was identified by the inspectors for failure to comply with the spacing standard for sprinkler systems in accordance with the licensee Fire Protection Program (FPP) requirements. Specifically, the inspectors identified three permanent scaffolds that obstructed three separate fire protection suppression sprinkler heads in the 2B diesel oil storage tank room. No replacement sprinklers had been installed. After the inspector's identification of this issue the licensee removed the decking and open grating from the scaffolds, which allowed the permanent scaffold configuration to be within the FPP requirements.

The inspectors determined that the licensee's failure to comply with the spacing standard for sprinkler systems in accordance with the Braidwood FPP was a performance deficiency. The inspectors concluded that the finding was greater than minor because this issue was associated with the external factor attribute of the Initiating Events cornerstone and affected the 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 that the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Appendix F, because it was associated with fire protection defense-in-depth strategies involving the suppression system. The inspectors determined that the finding has a low degradation rating since only three out of eleven sprinklers in the room were obstructed and for each sprinkler obstructed there was another functional head within ten feet of combustible concern. In addition, other aspects of the system complied with NFPA code. Therefore, the finding was determined to be of very low safety significance. This finding has a cross-cutting aspect in the area of Human Performance because the licensee failed to properly evaluate the scaffolding placement due to the engineering staff using poor assumptions. (H.1 (b)) (Section 1R05)

- Severity Level IV. A finding of very low safety significance and an associated NCV of Braidwood Operating License Condition 2.E was identified by the inspectors for the licensee's failure to obtain NRC approval before making changes to the approved FPP. Specifically, the licensee permanently isolated the manual

carbon dioxide (CO₂) suppression system to the upper cable spreading rooms (UCSRs) without prior NRC approval. The licensee entered this issue in the corrective action program (CAP) and implemented compensatory actions to verify detection system operability and implement fire watches upon any single detector failure. Additionally, the licensee plans to submit a licensee change request associated with the removal of CO₂ suppression from the UCSR.

The finding was determined to be more than minor because the inspectors could not reasonably determine that the isolation would not have ultimately required NRC prior approval. The inspectors determined this finding to be a Severity Level IV violation due to having very low safety significance (Green) based on the Phase 2 SDP evaluation. This finding is related to the cross-cutting area of Human Performance for failure to use conservative assumptions in decision-making and to adopt a requirement that demonstrates the proposed action is safe in order to proceed with respect to reviewing the plant design and license basis. (H.1(b)) (Section 1R05.3)

B. Licensee-Identified Violations

No violations of significance were identified.

REPORT DETAILS

Summary of Plant Status

Unit 1 operated at or near full power throughout the inspection period with minor exceptions.

Unit 2 operated at or near full power throughout the inspection period with minor exceptions.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

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

- 2A chemical and volume control (CV) during 2B CV pump maintenance;
- 1B safety injection (SI) during 1A SI pump work window;
- 2A emergency diesel generator (EDG) during 2B EDG work window, and
- 1B essential service water (SX) while 1A SX was out-of-service for temporary modification installation.

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), Technical Specification (TS) requirements, outstanding work orders (WOs), 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 CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

These activities constituted four partial system walkdown samples as defined in Inspection Procedure (IP) 71111.04-05.

b. Findings

No findings of significance were identified.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

On September 11 and 25, 2008, the inspectors performed a complete system alignment inspection of the following system to verify the functional capability of the system:

- 2A SI system.

This system was selected because it was considered both safety-significant and risk-significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment lineups, electrical power availability, system pressure and temperature indications, as appropriate, and component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. A review of a sample of past and outstanding WOs was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the CAP database to ensure that system equipment alignment problems were being identified and appropriately resolved. Documents reviewed are listed in the Attachment.

These activities constituted one complete system walkdown sample 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:

- Unit 1 diesel oil storage tank room (Fire Zone 10.1-1 and 10.2-1);
- Unit 2 diesel oil storage tank room (Fire Zone 10.1-2 and 10.2-2);
- Unit 1 general access area elevation 401 turbine building (Fire Zone 10.2-1);
- Unit 2 diesel driven auxiliary feedwater (AFW) pump room and day tank room, Fire Zone 11.4A-2;
- Unit 1 and Unit 2 lower cable spreading room CO₂ isolated and upper cable spreading room CO₂ license basis (Fire Zone 3.3A-1 and 2, and Fire Zone 3.3B-1 and 2); and
- verification of lower cable spreading room fire watches.

The inspectors reviewed areas to assess if the licensee had implemented a FPP 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.

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

b. Findings

Two findings were identified in sections 1R05.2 and 1R05.3, and one (1) Unresolved Items (URI) was opened in section 1R05.4.

.2 Fire Suppression Sprinkler Obstruction in the Diesel Oil Storage Tank Room

Introduction: A finding of very low safety significance and associated non-cited violation of the Braidwood Operating License Section 2.E, for the licensee's failure to comply with the spacing standard for sprinkler systems of the FPP was identified by the inspectors. Specifically, permanent scaffolding obstructed fire protection suppression sprinklers in the 2B diesel oil storage tank room and no replacement sprinklers were installed.

Description: On July 22, 2008, the inspectors performed a fire protection walkdown of the Unit 1 and Unit 2 diesel oil storage tank rooms. In the 2B diesel fuel oil storage tank room, the inspectors identified that a permanent scaffold with solid decking material was erected underneath a fire suppression sprinkler and next to a working platform. This permanent scaffold, in conjunction with the working platform, created a deck configuration below the sprinkler that was well over four feet wide. This obstructed the spray pattern of one of the foam based fire suppression sprinklers to a portion of the floor area in the diesel oil storage tank room. No sprinkler was installed to replace the one that had been obstructed. In that same room, the inspectors also identified two additional permanent scaffolds that were over four feet wide and obstructed the sprinkler head spray pattern. The licensee subsequently removed or reconfigured the decking of the permanent scaffold such that they were not greater than four feet wide.

Plant records indicated that the scaffolds were installed throughout 2004. The scaffolding was later made permanent using licensee procedure MA-AA-716-025, "Scaffold Installation, Modification, and Removal Request Process," Revision 0. This procedure required the licensee's engineering staff to inspect and evaluate the scaffolding. One of the evaluation criteria specified by the procedure was to determine if the scaffold would affect the coverage zone of any in-place fire protection sprinkler heads in the immediate proximity. The licensee identified no specific concerns or instructions when the scaffold was approved as permanent in December 2004.

The inspectors determined that the licensee was committed to National Fire Protection Association (NFPA) Code 13, "Standard for the Installation of Sprinkler Systems," 1983 Edition, and NFPA Code 16, Deluge Foam Water Sprinkler and Sprays Systems, 1980 Edition, according to the licensee's Fire Protection Report. Per these standards, sprinklers shall be installed under decks that are over four feet wide to prevent obstruction for the spray pattern of the sprinkler. Specifically, Section 4-2.1 of NFPA-16 stated that foam-water sprinkler system designs shall conform to all of the applicable requirements of NFPA-13 except where otherwise specified in NFPA-16. Section 4-4.11 of NFPA-13 specified that sprinklers be installed under decks and galleries that are over four feet wide. As NFPA-16 did not specifically address sprinkler obstructions, the requirements of NFPA-13 pertaining to obstructions applied.

Analysis: The inspectors determined that the licensee's failure to comply with the spacing standard for sprinkler systems in accordance with the FPP was a performance deficiency. The inspector concluded that the finding was greater than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Disposition Screening." Specifically, it was associated with the external factor attribute of the Initiating Events cornerstone and affected the 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 that the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Appendix F, because it was associated with fire protection defense-in-depth strategies involving suppression systems. The inspectors determined that the finding has a low degradation rating since only three out of eleven sprinklers in the room was obstructed and for each block sprinkler head there was another functional sprinkler within ten feet of combustible concern. In addition, other aspects of the system complied with NFPA code. Therefore, the finding was determined to be of very low safety significance (Green).

This finding has a cross-cutting aspect in the area of Human Performance because the licensee's engineering staff used poor assumptions when evaluating the placement of the scaffold. (H.1 (b))

Enforcement: Braidwood Station's Operating License Condition 2.E states, in part, that the licensee shall implement and maintain in effect all provisions of the approved FPP as described in the licensee's Fire Protection Report. The Fire Protection Report stated that the licensee's sprinkler system conformed to NFPA Code 13, 1983, edition. Per the NFPA standard, sprinklers shall be installed under decks that are over four feet wide. Contrary to the above, on December 04, 2004, the licensee approved permanent scaffolds in the diesel oil storage tanks room that were erected in configuration that in which they were over five feet wide. Each scaffold deck obstructed a fire suppression sprinkler and no sprinkler was installed to replace the obstructed one. Because this violation was of very low safety significance and because it was entered into the licensee's CAP as Issue Report (IR) 770364, this violation is being treated as a NCV, consistent with Section VI.A.1 of the NRC enforcement policy. (NCV 05000456/2008004-01; 05000457/2008004-01)

.3 Upper Cable Spreading Room Carbon Dioxide Fire Suppression Isolated

Introduction: The inspectors identified a finding of very low safety significance and an associated non-cited violation of License Condition 2.E, "Fire Protection Program," for the licensee's failure to obtain NRC approval prior to making changes to the approved FPP. Specifically, the licensee permanently abandoned the automatic CO₂ fire suppression system to the Unit 1 and Unit 2 upper cable spreading rooms (UCSRs) without prior NRC approval.

Description: The inspectors reviewed the licensee's LS-AA-128, Fire Protection Change Regulatory Review, evaluation for abandonment of the CO₂ fire suppression system in the Unit 1 and Unit 2 UCSRs. The fire suppression systems in the Braidwood UCSRs were originally licensed under a deviation from Branch Technical Position (BTP) CMEB 9.5-1. BTP CMEB 9.5-1 required automatic water fire suppression in UCSRs. The licensee proposed an automatic halon fire suppression system and a backup manual CO₂ fire suppression system rather than automatic water suppression. Based on NRC questions about reliability, the licensee proposed modifications to the halon system and electronic monitoring of interior doors in the UCSRs. Based on these additional actions the NRC accepted the licensee's proposed design as an acceptable deviation from BTP CMEB 9.5-1.

On July 23, 2007, the licensee permanently mechanically isolated the CO₂ fire suppression system to the UCSRs in accordance with their LS-AA-128 evaluation, dated January 10, 2007. The evaluation concluded that the CO₂ suppression system was not credited for fire suppression and permanently abandoning the system did not represent an adverse affect on fire suppression and the ability to achieve and maintain safe shutdown. Based on this conclusion, the licensee determined the change to the FPP could be made without prior NRC approval.

The inspectors questioned the conclusion of the LS-AA-128 evaluation that the removal of CO₂ suppression did not result in an adverse affect on safe shutdown. Additional review of the issue was provided by fire protection inspectors in the Region III and Headquarters Offices to determine whether the evaluation was completed in accordance with Generic Letter 86-10, which governs changes to the FPP. The inspectors concluded that the LS-AA-128 evaluation did not provide adequate justification for the conclusion that there was no adverse impact on achieving and maintaining safe shutdown. In addition, the evaluation did not address the adequacy of the halon system alone to address all postulated fire scenarios. Based on the lack of adequate justification for the conclusions documented in the LS-AA-128 evaluation, the inspectors concluded that prior NRC approval was required.

The licensee entered this issue in the CAP and implemented compensatory actions to verify detection system operability and implement fire watches upon any single detector failure. Additionally, the licensee plans to submit a licensee change request associated with the removal of CO₂ suppression from the UCSRs.

Analysis: The inspectors determined that the licensee's failure to obtain NRC approval before the CO₂ fire suppression system was permanently isolated was a performance deficiency. Specifically, the licensee failed to provide an adequate justification as to why isolating the CO₂ suppression system did not adversely affect the ability to achieve and maintain safe shutdown. The finding was determined to be more than minor because

the inspectors could not reasonably determine that the isolation would not have ultimately required NRC prior approval. This finding is related to the cross-cutting area of Human Performance for failure to use conservative assumptions in decision-making and to adopt a requirement that demonstrates the proposed action is safe in order to proceed with respect to reviewing the plant design and license basis (H.1(b)).

Since the failure to obtain prior NRC approval for changing the FPP has the potential for impacting the NRC's ability to perform its regulatory function, this finding was being dispositioned under the traditional enforcement process. However, if possible, the underlying technical issue is evaluated under the SDP to determine the severity of the violation. In this case, the underlying technical issue affected the Initiating Events Cornerstone.

The finding was evaluated using IMC 0609 Appendix F, "Fire Protection Significance Determination Process (SDP)." The finding category assigned was Fixed Fire Protection Systems because the Unit 1 and Unit 2 UCSR CO₂ fire suppression system was impacted. The degradation rating was determined to be "High" since the suppression system was isolated and would not have functioned to suppress a fire in the rooms. The duration of the degraded condition was greater than 30 days. The finding did not screen as very low safety significance (Green) in the phase 1 analysis and a phase 2 SDP analysis was required.

The inspectors and the RIII senior reactor analyst (SRA) performed an SDP phase 2 evaluation. The UCSRs contained no fixed ignition sources other than a control room ventilation subsystem. The likelihood ratings for transient combustible and hot work fires was assumed to be low because it is not a normally occupied area, plant personnel do not generally pass through the area, and the frequency of maintenance in the room was considered to be low. The UCSRs also have an automatic halon suppression system which was unaffected by the finding. The safe shutdown path for a fire in the UCSRs involves manual operator actions and was also unaffected by the fire.

The SRA determined that the fire scenario of interest for this finding was fire damage state (FDS) 2, which is widespread fire damage in the fire area. The fire suppression system would not normally prevent fire damage to cables or components near the ignition source (FDS 1) but would be expected to limit the fire damage in the room and protect against widespread fire damage (FDS 2). Since none of the fire area barriers were impacted by the finding, fire damage across barriers (FDS 3 scenarios) was not evaluated.

The fire ignition frequency was estimated to be 1.4E-4/yr, assuming the ignition sources included a ventilation subsystem, transient combustibles, and hot work. The unavailability of the automatic Halon suppression system was estimated to be 2.0E-2 and the CO₂ suppression system was assumed to be failed because of the finding. A screening value of 0.1 was used for the failure of the operators to safely shutdown the plant given widespread fire damage in the rooms. The result was an estimated change in core damage frequency (CDF) of 2.8E-7/yr, which is a finding of very low safety significance (Green).

Enforcement: Condition 2.E of the Operating License for Braidwood Units 1 and 2 states, in part, that the licensee may make changes to the approved FPP without prior approval of the Commission, only if those changes would not adversely affect the ability

to achieve and maintain safe shutdown in the event of a fire. Contrary to the above, on January 10, 2007, the licensee determined that NRC approval was not required prior to installing a permanent modification to abandon the CO₂ suppression system in the UCSRs, which adversely affected the ability to achieve and maintain safe shutdown. In accordance with the NRC Enforcement Policy, this violation was classified as a Severity Level IV violation because the underlying technical issue was of very low safety significance. Because this non-willful violation was non-repetitive, and was captured in the licensee's CAP as IR 813441, it is considered an NCV consistent with Section VI.A.1 of the NRC Enforcement Policy. (NCV 05000456/2008004-02; 05000457/2008004-02)

.4 Inadvertent Isolation of Lower Cable Spreading Room Carbon Dioxide Fire Suppression

On August 8, the licensee performed procedure MA-BR-EM-5-F002, "Lower Cable Spreading Room Low Pressure CO₂ System Air Actuation Test," in the Unit 2 lower cable spreading room. The automatic CO₂ system is the only fire suppression system in the lower cable spreading room, with manual water hose stations and fire extinguishers as a backup. During the surveillance the test, air did not successfully migrate through the flowpath from the CO₂ storage tank to the Unit 2 lower cable spreading room discharge nozzles. Troubleshooting activities identified that the sensing lines for the lower cable spreading room discharge valves were not pressurized.

Further investigation identified that, on July 23, 2007, a blank flange had been installed on the CO₂ system header as part of a permanent modification to the CO₂ system in the Unit 1 and Unit 2 upper cable spreading rooms. Installation of the blank flange isolated the sensing lines for the lower cable spreading room. This resulted in isolation of the Unit 1 and Unit 2 lower cable spreading room automatic fire suppression system since July 23, 2007. However, additional information was needed by the inspectors to determine the impact of this condition and allow it to be fully evaluated.

At the conclusion of the inspection period, the licensee had completed a modification to move the discharge valve sensing lines so that they were no longer isolated. The licensee also completed post maintenance air puff tests to verify system operability. Pending further review of this issue, it will remain an open URI. (URI 05000456/2008004-03, 05000457/2008004-03)

1R06 Flooding (71111.06)

.1 Internal Flooding

a. Inspection Scope

The inspectors reviewed selected risk important plant design features and licensee procedures intended to protect the plant and its safety related equipment from internal flooding events. The inspectors reviewed flood analyses and design documents, including the UFSAR, engineering calculations, and abnormal operating procedures to identify licensee commitments. The specific documents reviewed are listed in the Attachment to this report. In addition, the inspectors reviewed licensee drawings to identify areas and equipment that may be affected by internal flooding caused by the failure or misalignment of nearby sources of water, such as the fire suppression or the circulating water systems. The inspectors also reviewed the licensee's corrective action documents with respect to past flood-related items identified in the CAP to verify the

adequacy of the corrective actions. The inspectors performed a walkdown of the following plant areas to assess the adequacy of watertight doors and verify drains and sumps were clear of debris and were operable. The inspectors also verified that the licensee complied with its commitments for aligning fire protection to CV pumps, following a failure of residual heat removal leak detection sump. Documents reviewed are listed in the Attachment.

- CV pump rooms and the residual heat removal pump rooms

This inspection constituted one internal flooding sample as defined in IP 71111.06-05.

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:

- control room ventilation system (emergency mode); and
- Unit 1 and Unit 2 EDGs.

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 structures, systems, and components (SSC)/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.

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:

- 1B AFW pump work window while 1A steam generator powered operated relief valve was out-of-service;
- 2A EDG during 2B EDG work window;
- 1B and 2B SX systems following discovery of Bryozoan colonies infestation in the intake forebays;
- 1A EDG following operations staff placement of Clearance Order 63970;
- lower cable spreading room cardox system following "puff test" failure;
- control room emergency ventilation system differential pressure testing and subsequent test failures;
- planned 5-year preventive maintenance on 2B EDG work window and subsequent test failures; and
- startup and shutdown of 2A CV pump following planned system work window and surveillance testing.

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 eight samples as defined in IP 71111.13-05.

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:

- failed residual heat removal pump room leak detection sump and impact of aligning fire protection to CV pumps;
- 2A AFW pump cubicle cooler failed to start;
- 1B AFW pump after removal of oil soaked lagging;
- Unit 1 and Unit 2 SX system following discovery of Bryozoan colony infestation of Unit 1 and Unit 2 circulating water forebays; and
- upper cable spreading room cardox system (operability).

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.

This operability inspection constituted five samples as defined in IP 71111.15-05.

b. Findings

No findings of significance were identified.

1R18 Plant Modifications (71111.18)

.1 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the following temporary modification:

- Engineering Change 372033 - Installation of temporary reliable power feed to the 1A SX strainer.

The inspectors compared the temporary configuration change and associated 10 CFR 50.59 screening and evaluation information against the design basis, the UFSAR, and the TS, as applicable, to verify that the modification did not affect the

operability or availability of the affected system. The inspectors, as applicable, performed field verifications to ensure that the modification was installed as directed; the modification operated as expected; modification testing adequately demonstrated continued system operability, availability, and reliability; and that operation of the modification did not impact the operability of any interfacing systems. Lastly, the inspectors discussed the temporary modification with operations, engineering, and training personnel to ensure that the individuals were aware of how extended operation with the temporary modification in place could impact overall plant performance.

This inspection constituted one sample as defined in IP 71111.18-05.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19)

.1 Post-Maintenance Testing

a. Inspection Scope

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

- 1B AFW pump rocker gasket replacement;
- 2B CV pump dynamic vent following maintenance;
- RY8000A control fuse/clip holder replacement and testing;
- 2B diesel generator after work window and inadequate maintenance;
- partial performance of 2BwOSR 3.6.3.5 for 2MS018B (stroke test);
- stroke test following planned maintenance/calibration of 1AF005; and
- SX strainer safety-related power source.

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 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 seven post-maintenance testing samples as defined in IP 71111.19-05.

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 and TS requirements:

- BwOL 3.7.10 control room ventilation filtration system testing (routine);
- 2B EDG quick start surveillance result (routine);
- Station Auxiliary Transformer 142-2 crosstie to Bus 241 18-month surveillance (routine);
- 2B CV pump American Society of Mechanical Engineers (ASME) (IST);
- 2B residual heat removal pump ASME (IST); and
- 1B RHR pump and valve quarterly ASME testing (ISO Valve).

The inspectors observed in-plant activities and reviewed procedures and associated records to determine whether:

- any preconditioning occurred;
- effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- acceptance criteria were clearly stated, demonstrated operational readiness, and were consistent with the system design basis;
- plant equipment calibration was correct, accurate, and properly documented;
- as left setpoints were within required ranges;
- the calibration frequency was in accordance with TS, 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 ASME Code, Section XI, 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 the 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 three routine surveillance testing samples, two inservice testing samples, and one containment isolation valve sample as defined in IP 71111.22, Sections -02 and -05.

b. Findings

An unresolved issue was opened in section 1R22.2.

.2 Bryozoan Colonies Infestation At The Lake Screenhouse Circulating Water Forebays

On September 2, 2008, during the performance of 1BwVSR 5.5.8.SX-1 "ASME Surveillance Requirements for 1A Essential Service Water Pump," the 1A SX pump discharge strainer experienced high differential pressure. Shortly after the high differential pressure alarm annunciated, the licensee noted differential pressure across the discharge strainer exceeded twenty psid (normally less than six psid). Additionally, the SX system discharge header pressure dropped by 40 psig (normally 100 -105 psig) and system flow had decreased more than 3000 gpm. The licensee suspended the surveillance and entered TS LCO 3.7.8 Action Statement, A.1 for inoperable SX system.

A licensee investigation into this issue identified that bryozoan colonies had accumulated in the circulating water forebays during the summer through deposition and subsequent growth. Bryozoans or "moss animals" are colonial organisms consisting of many similar connecting zooids, each with its independent food-gathering structure, mouth, digestive tract, muscles, nervous system and reproductive ability. They reproduce asexually creating a cyst like structure called a statoblast, which serves to reseed and spread these colonies. Most bryozoan colonies occur as flat encrustations or grow in upright arborescent patterns; however, a species of bryozoan found in Midwest lakes and the Mississippi River (*Pectinatella Magnifica*) secretes a gelatinous ball, which grows bigger as the colony increases its number. These massive colonies form jelly-like balls that can exceed 60 centimeters in diameter.

The licensee identified that the greatest accumulation of both dead and living bryozoans colonies on the floor of the forebays were downstream of the traveling screens and decreased significantly toward the north side of the forebays (closer to the circulating water pump intake). In Unit 1, the bryozoan colonies were between two to

three feet deep downstream of each traveling screen in the forebay (east and west side). This was consistent on two of the forebays on Unit 1 (1B and 1C). The 1A forebay had a lower amount of bryozoan colonies, approximately one to six inches in depth. On Unit 2, bryozoan colonies were also two to three feet deep downstream of the east travel screens, but, significantly lower downstream of the west traveling screens, approximately two to six inches. The licensee approximated that the total biomass of bryozoan colonies on Unit 2 was lower than Unit 1 by 30 percent.

During performance of 1BwVSR 5.5.8.SX-1, the control switch for the SX strainer backwash was placed in the "OFF" position. The SX strainer backwash function normally occurs automatically every eight hours or on high strainer differential pressure. The strainer backwash motor and isolation drain valve power supplies and control circuits are not safety-related or seismically qualified and following a seismic event these components could lose power. Specifically, the SX strainer motor is powered through an electrical panel with an automatic/manual control switch mounted within the SX pump room and if damage to internal electrical control panel circuits occurs during a seismic event, the SX strainer motor may not function.

Weeks prior to the 1A SX pump surveillance test, operators noted indications of abnormal flow indication through the lake screenhouse forebays. Specifically, on August 17, 2008, Braidwood Unit 1 experienced a reduction of approximately two percent in circulation water flow. On August 22, 2008, Unit 2 experienced a nine percent reduction in circulating water flow. Shortly thereafter, Unit 1 experienced an additional six percent reduction in circulating water flow. The following day the Unit 1 circulating water flow return to normal and the Unit 2 began a slow trend toward the normal circulating water flow rate. On August 29, 2008, Unit 2's slow trend to normal flow rate stopped and circulating water flow rate remained four percent below normal. On August 25 and 31, 2008, while in its normal system alignment (pump ON and backwash strainer in automatic) the 1B SX system pump discharge strainer high differential pressure alarm annunciated. The automatic backwash feature was able to clear the high differential pressure (dp) condition experienced by the strainer in approximately 30 minutes. On August 26, 2008, the 2A SX pump discharge strainer high differential pressure alarm annunciated, again. The systems automatic backwash feature was able to clear the high dp condition.

Subsequently, on September 4, 2008, the licensee attempted to run the 2A SX pump with the discharge strainer backwash motor out of service and unavailable. Following the initially increase in differential pressure (greater than four psid) the licensee attempted to manually backwash the discharge strainer using licensee procedure BwMP 3301, "Manual Backwash Operations." The operators and mechanical maintenance staff were unsuccessful in performing the manual backwash of the strainer. The licensee swap from the 2A SX pump to the 2B SX pump after the discharge strainer differential pressure had quickly risen to 10.1 psid. The licensee declared the 2A SX pump inoperable and unavailable.

The Inspectors reviewed the licensee's CAP for previous Bryozoa-related issues and ascertained that in October of 2005; the licensee discovered the abnormal growth of an unnamed species of Bryozoa in the circulating water intake forebay locations. Shortly after the 1A circulating water pump was secured on October 2, 2005, the 2A and 2B SX pump discharge header pressure and the 2A SX strainer differential pressure high annunciated in the control room.

Following the 2005 event, the licensee performed an equipment apparent cause evaluation (EACE) to address this issue. The EACE concluded that the apparent cause for the abnormal growth of bryozoans in the circulating water forebays was indeterminate. The EACE concluded that the impact of bryozoa to the station raw water systems (circulating water, non-safety related service water, fire protection and SX) had been minimal. This conclusion was because the monitored SX strainer backwashes operated normally, experienced normal differential pressures and performed SX strainer backwash cycles as required and as designed. The licensee risk assessment also concluded that based on the Unit 1 and Unit 2 SX system performance, as monitored via the Adverse Condition Monitoring Plan, the licensee assessed the consequences of bryozoan growth in the forebays as a low risk plant operations. The risk assessment also concluded that there was not a regulatory impact caused by the abnormal growth of bryozoans in the circulating water forebays.

At the conclusion of the inspection period, the licensee completed inspections and cleanup of each lake greenhouse forebay. The licensee declared both the 1A and the 2A SX pump operable. The inspectors were reviewing the adequacy of the corrective actions identified following the 2005 Bryozoan colonies infestation. Additionally, the inspectors were evaluating the overall impact of the Bryozoan infestation on both trains of the essential service water system for both units. Pending completion of this review, the issue will remain an open URI. (URI 05000456/2008004-04, 05000457/2008004-04)

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine licensee emergency drill on July 23, 2008, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations for seismic activities followed by a loss of coolant accident to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the licensee drill critique to compare any inspector-observed weakness with those identified by the licensee staff in order to evaluate the critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the CAP. As part of the inspection, the inspectors reviewed the drill package and other documents listed in the Attachment.

This emergency preparedness drill inspection constituted one sample as defined in IP 71114.06-05.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01)

.1 Plant Walk Downs and Radiation Work Permit Reviews

a. Inspection Scope

The inspectors reviewed the licensee's physical and programmatic controls for highly activated and/or contaminated materials (non-fuel) stored within spent fuel or other storage pools.

This inspection constituted one sample as defined in IP 71121.01-5.

b. Findings

No findings of significance were identified.

.2 Problem Identification and Resolution

a. Inspection Scope

The inspectors evaluated the licensee's process for problem identification, characterization, prioritization, and verified that problems were entered into the CAP and resolved. For repetitive deficiencies and/or significant individual deficiencies in problem identification and resolution, the inspectors verified that the licensee's self-assessment activities were capable of identifying and addressing these deficiencies.

This inspection constituted one sample as defined in IP 71121.01-5.

The inspectors reviewed licensee documentation packages for all performance indicator (PI) events occurring since the last inspection to determine if any of these PI events involved dose rates greater than 25 R/hr at 30 centimeters or greater than 500 R/hr at 1 meter. Barriers were evaluated for failure and to determine if there were any barriers left to prevent personnel access. Unintended exposures greater than 100 millirem total effective dose equivalent (or greater than 5 rem shallow dose equivalent or greater than 1.5 rem lens dose equivalent) were evaluated to determine if there were any regulatory overexposures or if there was a substantial potential for an overexposure.

This inspection constituted one sample as defined in IP 71121.01-5.

b. Findings

No findings of significance were identified.

.3 High Risk Significant, High Dose Rate, High Radiation Area and Very High Radiation Area Controls

a. Inspection Scope

The inspectors held discussions with the Radiation Protection Manager concerning high dose rate/high radiation area and very high radiation area controls and procedures, including procedural changes that had occurred since the last inspection, in order to assess whether any procedure modifications substantially reduced the effectiveness and level of worker protection.

This inspection constituted one sample as defined in IP 71121.01-5.

The inspectors discussed with radiation protection supervisors the controls that were in place for special areas that had the potential to become very high radiation areas during certain plant operations to determine if these plant operations required communication beforehand with the radiation protection group, so as to allow corresponding timely actions to properly post and control the radiation hazards.

This inspection constituted one sample as defined in Inspection Procedure 71121.01-05.

b. Findings

No findings of significance were identified.

.4 Radiation Worker Performance

a. Inspection Scope

The inspectors reviewed radiological problem reports for which the cause of the event was due to radiation worker errors to determine if there was an observable pattern traceable to a similar cause and to determine if this perspective matched the corrective action approach taken by the licensee to resolve the reported problems. Problems or issues with planned and completed corrective actions were discussed with the Radiation Protection Manager.

This inspection constituted one sample as defined in IP 71121.01-5.

b. Findings

No findings of significance were identified.

.5 Radiation Protection Technician (RPT) Proficiency

a. Inspection Scope

The inspectors reviewed radiological problem reports for which the cause of the event was radiation protection technician error to determine if there was an observable pattern traceable to a similar cause and to determine if this perspective matched the corrective action approach taken by the licensee to resolve the reported problems.

This inspection constituted one sample as defined in IP 71121.01-5.

b. Findings

No findings of significance were identified.

2OS2 As-Low-As-Reasonably-Achievable Planning And Controls (71121.02)

.1 Source-Term Reduction and Control

a. Inspection Scope

The inspectors reviewed licensee records to determine the historical trends and current status of tracked plant source terms and whether the licensee was making allowances and developing contingency plans for expected changes in the source term due to changes in plant fuel performance issues or changes in plant primary chemistry.

This inspection constituted one sample as defined in IP 71121.02-5.

b. Findings

No findings of significance were identified.

.2 Declared Pregnant Worker

a. Inspection Scope

The inspectors reviewed dose records of declared pregnant workers for the current assessment period to verify that the exposure results and monitoring controls employed by the licensee complied with the requirements of 10 CFR 20.

This inspection constituted one sample as defined in IP 71121.02-5.

b. Findings

No findings of significance were identified.

.3 Problem Identification and Resolutions

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, and Special Reports related to the As-Low-As-Reasonably-Achievable program since the last inspection to determine if the licensee's overall audit program's scope and frequency for all applicable areas under the Occupational Cornerstone met the requirements of 10 CFR 20.1101(c).

This inspection constituted one sample as defined in IP 71121.02-5.

The licensee's CAP was also reviewed to determine if repetitive deficiencies and/or significant individual deficiencies in problem identification and resolution had been addressed.

This inspection constituted one sample as defined in IP 71121.02-5.

b. Findings

No findings of significance were identified.

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 documents and calculations associated with a discharge of radioactive waste gas to the Containment Building as a result of operator valve misalignment on April 24, 2008. The inspectors determined if the licensee evaluated and analyzed the effluent discharge to assure that the release was through normal and monitored pathways. The inspectors reviewed the licensee's gaseous sample analyses and discharge pathway monitor results. Additionally, the licensee's effluent dose calculations associated with this event were reviewed. The inspectors reviewed the licensee's actions as a result of the event to verify that the radioactive effluent sampling and analysis requirements were satisfied and that discharges of radioactive gases were properly evaluated and documented. The inspectors evaluated the licensee's program including provision for required or voluntary offsite notifications to state and local officials and, if appropriate, to the NRC.

The inspectors reviewed corrective action reports from the radioactive effluent treatment and monitoring program related to this event, 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;
- implementation/consideration of risk significant operational experience feedback; and
- ensuring problems were identified, characterized, prioritized, entered into a corrective action, and resolved.

No samples were accredited for this inspection effort.

b. Findings

No findings of significance were identified.

.2 Review of Blowdown Line Operations and Tritium Remediation Efforts

The inspectors continued to monitor the licensee's activities resulting from previous inadvertent leaks of tritiated liquid from the blowdown line to the Kankakee River. The inspection activities included the following:

- periodic inspections of all vacuum breaker vaults;
- periodic inspections of remediation system pump operations at the Exelon Pond, vacuum breaker 1, vacuum breaker 2, and lagoon area;
- efforts to reduce tritium concentrations in secondary plant systems; and
- participation in Community Information Meetings.

The inspectors verified that minor issues identified during these inspection activities were entered into the licensee's CAP. This inspection did not represent a completed inspection sample. Documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

2PS2 Radioactive Material Processing and Transportation (71122.02)

.1 Radioactive Waste System

a. Inspection Scope

The inspectors reviewed the liquid and solid radioactive waste system description in the UFSAR for information on the types and amounts of radioactive waste (radwaste) generated and disposed. The inspectors reviewed the scope of the licensee's audit program with regard to radioactive material processing and transportation programs to verify that it met the requirements of 10 CFR 20.1101(c).

This inspection constituted one sample as defined in IP 71122.02-5.

b. Findings

No findings of significance were identified.

.2 Radioactive Waste System Walkdowns

a. Inspection Scope

The inspectors performed walkdowns of the liquid and solid radwaste processing systems to verify that the systems agreed with the descriptions in the UFSAR and the Process Control Program and to assess the material condition and operability of the systems. The inspectors reviewed the status of radwaste processing equipment that was not operational and/or was abandoned in place. The inspectors reviewed the licensee's administrative and physical controls to ensure that the equipment would not contribute to an unmonitored release path or be a source of unnecessary personnel exposure.

The inspectors reviewed changes to the waste processing system to verify that the changes were reviewed and documented in accordance with 10 CFR 50.59 and to assess the impact of the changes on radiation dose to members of the public. The inspectors reviewed the current processes for transferring waste resin into shipping containers to determine if appropriate waste stream mixing and/or sampling procedures were utilized. The inspectors also reviewed the licensee's methods for waste concentration averaging to determine if representative samples of the waste product were provided for the purposes of waste classification, as required by 10 CFR 61.55.

This inspection constituted one sample as defined in IP 71122.02-5.

b. Findings

No findings of significance were identified.

.3 Waste Characterization and Classification

a. Inspection Scope

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

This inspection constituted one sample as defined in IP 71122.02-5.

b. Findings

No findings of significance were identified.

.4 Shipment Preparation and Shipment Manifests

a. Inspection Scope

The inspectors reviewed the documentation of shipment packaging, radiation surveys, package labeling and marking, vehicle inspections and placarding, emergency instructions, determination of waste classification/isotopic identification, and licensee verification of shipment readiness for five non-excepted material and radwaste shipments made in 2007 and 2008. The shipment documentation reviewed consisted of:

- one Low Specific Activity (LSA-I);
- two Low Specific Activity (LSA-II);
- one Surface Contaminated Object (SCO-I) Shipment to Waste Processors; and
- one Type-B(U) Package to Barnwell.

For each shipment, the inspectors determined if the requirements of 10 CFR 20 and 61 and those of the Department of Transportation (DOT) in 49 CFR 170-189 were met. Specifically, records were reviewed and staff involved in shipment activities was interviewed to determine if packages were labeled and marked properly, if package and transport vehicle surveys were performed with appropriate instrumentation, if radiation survey results satisfied DOT requirements, and if the quantity and type of radionuclides in each shipment were determined accurately. The inspectors also determined whether shipment manifests were completed in accordance with DOT and NRC requirements, if they included the required emergency response information, if the recipient was authorized to receive the shipment, and if shipments were tracked as required by 10 CFR 20, Appendix G.

This inspection constituted one sample as defined by IP 71122.02-5.

Selected staff involved in shipment activities were observed by the inspectors to determine if they had adequate skills to accomplish shipment related tasks and to determine if the shippers were knowledgeable of the applicable regulations to satisfy package preparation requirements for public transport with respect to NRC Bulletin 79-19, "Packaging of Low-Level Radioactive Waste for Transport and Burial," and 49 CFR Part 172 Subpart H.

This inspection constituted one sample as defined by IP 71122.02-5.

b. Findings

No findings of significance were identified.

.5 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed condition reports, audits and self-assessments that addressed radioactive waste and radioactive materials shipping program deficiencies since the last inspection to verify that the licensee had effectively implemented the CAP and that problems were identified, characterized, prioritized and corrected. The inspectors also verified that 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 material and shipping programs since the previous inspection, interviewed staff and reviewed documents to determine if the following activities were being 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.

This inspection constituted one sample as defined in IP 71122.02-5.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

40A1 Performance Indicator Verification (71151)

Cornerstone: Occupational Radiation Safety

.1 Occupational Exposure Control Effectiveness

a. Inspection Scope

The inspectors sampled licensee submittals for the Occupational Radiological Occurrences PI for the period from the first quarter 2007 through the second quarter 2008. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's assessment of the PI for occupational radiation safety to determine if indicator related data was adequately assessed and reported. To assess the adequacy of the licensee's PI data collection and analyses, the inspectors discussed with radiation protection staff the scope and breadth of its data review and the results of those reviews. The inspectors independently reviewed electronic dosimetry dose rate and accumulated dose alarm reports and the dose assignments for any intakes that occurred during the time period reviewed to determine if there were potentially unrecognized occurrences. The inspectors also conducted walkdowns of numerous locked high and very high radiation area entrances to determine the adequacy of the controls in place for these areas.

This inspection constituted one occupational radiological occurrences sample as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

.2 Radiological Effluent TS/Offsite Dose Calculation Manual Radiological Effluent Occurrences

a. Inspection Scope

The inspectors sampled licensee submittals for the Radiological Effluent TS/Offsite Dose Calculation Manual Radiological Effluent Occurrences PI for the period from the third quarter of 2007 through the third quarter 2008. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's issue report database and selected individual reports generated since this indicator was last

reviewed to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. The inspectors reviewed gaseous effluent summary data and the results of associated offsite dose calculations for selected dates between third quarter of 2007 through the third quarter 2008, to determine if indicator results were accurately reported. The inspectors also reviewed the licensee's methods for quantifying gaseous and liquid effluents and determining effluent dose. Documents reviewed are listed in the Attachment.

This inspection constituted one Radiological Effluent TS/Offsite Dose Calculation Manual radiological effluent occurrences sample as defined in IP 71151-12.

b. Findings

No findings of significance were identified.

Cornerstone: Mitigating Systems

.3 Mitigating System Performance Indexes (MSPIs) PIs

a. Inspection Scope

The inspectors sampled the licensee's MSPI and PI submittals for the periods listed below. The inspectors used MSPI and PI definitions and guidance contained in Nuclear Energy Institute Document 99-02; "Regulatory Assessment Performance Indicator Guideline," Revision 5, to verify the accuracy of the data. The following were reviewed for a total of six samples:

Unit 1

- safety system functional features (MS05);
- emergency AC [alternating current] power system MSPI (MS06); and
- high pressure injection system MSPI (MS07).

Unit 2

- safety system functional failures (MS05);
- emergency AC power system MSPI (MS06); and
- high pressure injection system MSPI (MS07).

The inspectors reviewed licensee IRs, electronic logs, and other records for the period from July 1, 2006, through June 30, 2007, for each area specified above. The inspectors independently re-performed calculations where applicable. The inspectors compared the information acquired for each MSPI and PI to the data reported by the licensee. The inspectors verified that minor issues identified during the inspection were entered into the licensee's CAP. Documents reviewed are listed in the Attachment.

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. 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 attached list of documents reviewed.

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 the Attachment.

b. Findings

No findings of significance were identified.

.2 Daily CAP Reviews

a. 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.

4OA6 Management Meetings

.1 Exit Meeting Summary

On October 9, 2008, the inspectors presented the inspection results to 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.

.2 Interim Exit Meetings

Interim exit meetings conducted for:

- The results of Access Control to Radiologically Significant Areas and As-Low-As-Reasonably-Achievable Planning And Controls inspection were discussed with the Acting Plant Manager, Mr. R. Gadbois, on August 1, 2008.
- The results of the Radioactive Material Processing and Transportation inspection with the Plant Manager, Mr. L. Coyle, on September 26, 2008.

The inspectors confirmed that none of the potential report input discussed was considered proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

B. Hanson, Site Vice President
L. Coyle, Plant Manager
K. Aleshire, Emergency Preparedness Manager
D. Burton, Licensed Operator Requalification Training Group Lead
S. Butler, Operations Training Manager
B. Casey, Inservice Inspection Program
G. Dudek, Site Training Director
R. Gadbois, Maintenance Director
D. Gullott, Regulatory Assurance Manager
K. Hall, Operations
J. Knight, Nuclear Oversight Manager
T. McCool, Operations Director
J. Moser, Radiation Protection Manager
T. Schuster, Chemistry Manager
G. Panici, Senior Engineer
J. Petty, Licensing Engineer
M. Sears, Steam Generator Engineer
M. Smith, Engineering Director
T. Tierney, Chemistry, Environmental, and Radioactive Waste Manager

Nuclear Regulatory Commission

R. Skokowski, Chief, Reactor Projects Branch 3

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000456/2008004-01; 05000457/2008004-01	NCV	Failure To Comply With The Spacing Standard For Sprinkler Systems In Accordance With The Licensee Fire Protection Program Requirements (Section 1R05.2)
05000456/2008004-02; 05000457/2008004-02	NCV	Failure to Properly Evaluate Removal of Carbon Dioxide Fire Suppression for the Upper Cable Spreading Room Carbon Dioxide Fire Suppression (Section 1R05.3)
05000456/2008004-03; 05000457/2008004-03	URI	Inadvertent Isolation of Lower Cable Spreading Room Carbon Dioxide Fire Suppression (Section 1R05.4)
05000456/2008004-04; 05000457/2008004-04	URI	Bryozoan Infestation At The Lake Screenhouse Circulating Water Forebays(Section 1R22.4)

Closed

05000456/2008004-01; 05000457/2008004-01	NCV	Fire Suppression Sprinkler Obstruction in the Diesel Oil Storage Tank Room (Section1R05.2)
05000456/2008004-02; 05000457/2008004-02	NCV	Failure to Properly Evaluate Removal of Carbon Dioxide Fire Suppression for the Upper Cable Spreading Room Carbon Dioxide Fire Suppression (Section 1R05.3)

LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors 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.

1R04 Equipment Alignment

- BwOP SI-M1, Revision 17; Operating Mechanical Lineup Unit 1
- BwOP SI-M2, Revision 17; Operating Mechanical Lineup Unit 2
- BwOP SI-E1, Revision 9; Electrical Lineup - Unit 1 Operating
- BwOP SI-E2, Revision 6; Electrical Lineup - Unit 2
- BwOP DG-M3, Revision 12; Operating Mechanical Lineup Unit 2 2A DG
- BwOP DG-E3, Revision 5; Electrical Lineup – Unit 2 2A DG
- BwOP CV-E2, Revision 7; Electrical Lineup – Unit 2 Operating
- BwOP CV-M2, Revision 24; Chemical Volume Operating Mechanical Lineup Unit 2
- BwOP SX-M2, Revision 27; Operating mechanical Lineup Unit 2
- IR 739387; Fasteners Missing (Snubber 2CV08021S)
- IR 792144; NRC Identified Water Leaking from Catch at 2MS068D [NRC Identified]
- IR 795368; NRC Identified Water on Unit 2 AF Pump Room Floor [NRC Identified]
- IR 796838; NRC Identified U1 AF Diesel Airbox Fastener(s) Loose [NRC Identified]
- IR 796861; NRC Identified Airbox Fasteners Loose [NRC Identified]
- IR 796864; NRC Identified Flex Conduit Pulled From Connector [NRC Identified]
- IR 796865; NRC Identified Hose clamp Missing [NRC Identified]
- IR 798808; 2B AF Pump Area Housekeeping Concern
- IR 799106; NRC Questions Associated with IR 798808 on 2AF01PB
- IR 799425; 1B AF Pump Insulation Loose After Maintenance [NRC Identified]
- IR 804195; NRC and IEMA Question Compliance with TS SR 3.7.12.4 [NRC Identified]
- IR 805035; NRC Identified Peeling Paint on 2B AF Pump JW Exp Tank [NRC Identified]
- IR 805459; NRC/IEMA Identified Plant Concerns [NRC Identified]
- IR 814569; Out-Dated RP Survey Maps on TV Screen [NRC Identified]
- IR 815190; NRC Question Fire Marshal About Issues at Lake Screenhouse [NRC Identified]
- IR 816665; NRC Identified Door, SD-157, Open with No One Inside Room [NRC Identified]
- Drawing M-42; Diagram of Essential Service Water Unit 1 and 2 (Control Room Drawing)
- IR 821383; NRC/IEMA Questions From Tours of AB/FHB [NRC Identified]
- IR 821957; NRC Identified Concern with RP Compressed Cylinders in Aux Building [NRC Identified]
- Drawing M-61; Diagram of Safety Injection Unit 2 (Critical Control Room Drawing)

1R05 Fire Protection

- Pre-Fire Plan; Unit 2 Diesel Driven Aux. Feedwater Pump – Elevation (EI) 383'; Fire Zone 11.4A-2
- Pre-Fire Plan; Diesel Oil Tank Room 1A – El. 383'-0"; Fire Zone 10.1-1
- Pre-Fire Plan; Diesel Oil Tank Room 1B – El. 383'-0"; Fire Zone 10.2-1
- Pre-Fire Plan; Diesel Fuel Oil Storage Rooms 2A and 2B – El. 383'-0"; Fire Zone 10.1-2 and 10.2-2
- Pre-Fire Plan Map; Figure 2.3-13; Floor Plan El. 383'-0"
- NFPA 13; Standard for the Installation of Sprinkler Systems; 1985 Edition

- NFPA 16; Deluge Foam-Water Sprinkler and Spray Systems; 1980 Edition
- IR 798808; 2B AF Pump Area Housekeeping Concern; July 21, 2008 [NRC Identified]
- IR 799106; NRC Questions Associated with IR # 798808; July 22, 2008 [NRC Identified]
- IR 799207; NRC Questions Annual Maintenance Dates – Wheeled FP Ext.; July 22, 2008 [NRC Identified]
- IR 799384; IEMA Resident Identified SBA Fire Door Does Not Latch Closed
- IR 799972; NRC Questions Scaffold Decking in DOST Rooms [NRC Identified]
- IR 805480; Troubleshooting Identified Lack of Pressure at Solenoid
- IR 809865; NRC Issues with DOST Foam Sprinkler System Design [NRC Identified]
- IR 812432; NRC Identified Flashlight Found Lying in Cable Tray [NRC Identified]
- IR 813441; Inappropriate Abandonment of UCSR CO₂ System [NRC Identified]
- IR 815166; Minor Discrepancies in Fire Combustible Loading Calculations
- IR 815190; NRC Question Fire Marshal About Issues at Lake Screenhouse [NRC Identified]
- LS-AA-128, Revision 0; Regulatory Review of Proposed Changes to the Approved Fire Protection Program
- LS-AA-128; Review for Braidwood UCSR CO₂; January 10, 2007
- LS-AA-128; Review for Byron UCSR CO₂; August 29, 2008
- MA-AA-716-026; Station Housekeeping and Material Condition
- M-2058 Sheet 4, Revision G; P&ID/C&I Diagrams CO₂ and H₂ System Units 1 and 2
- Braidwood Fire Protection Report Section A5.8; Deviations From BTP CMEB 9.5-1; Section C.5.b
- M-58 Sheet 4, Revision M; Diagram of CO₂ System Units 1 and 2
- M-58 Sheet 2, Revision AC; Diagram of CO₂ and H₂ System Units 1 and 2
- M-58 Sheet 1, Revision AY; Diagram of CO₂ and H₂ System
- MA-BR-EM-5-FP002, Revision 10; Lower Cable Spreading Room Low Pressure CO₂ System Air Actuation Test
- BwAP 1110-1A4, Revision 9; GOCAR Required Compensatory Measures Action Response – Carbon Dioxide Fire Suppression Systems
- BwAP 1110-1, Revision 28; Fire Protection Program System Requirements
- OP-AA-101-113-1004, Attachment, Revision 13; Quick Human Performance Investigation for EC 361367 (UCSR CO₂ Modification)
- OP-AA-201-001, Revision 003; Fire Marshal Tours
- OP-AA-201-002, Revision 003; Fire Reports
- OP-AA-201-008, Revision 002; Pre-Fire Plan Manual
- OP-AA-201-009, Revision 007; Control of Transient Combustible Material
- Braidwood Fire Protection Report Section 2.3.7-8.c; Cable Spreading Room
- Byron SSER 5 Section 9.5.1.5; Fire Protection for Specific Plant Areas
- Fire Area Analysis, Fire Zone 3.2A-1; Unit 1 Nonsegregated Bus Duct Area
- Fire Area Analysis, Fire Zone 3.2A-2; Unit 2 Nonsegregated Bus Duct Area
- Fire Area Analysis, Fire Zone 3.2B-1; Lower Cable Spreading Area
- Fire Area Analysis, Fire Zone 3.2B-2; Lower Cable Spreading Area
- Fire Area Analysis, Fire Zone 3.2C-1; Lower Cable Spreading Area
- Fire Area Analysis, Fire Zone 3.2C-2; Lower Cable Spreading Area
- Fire Area Analysis, Fire Zone 3.2D-1; Lower Cable Spreading Area
- Fire Area Analysis, Fire Zone 3.2D-2; Lower Cable Spreading Area

1R06 Internal Flood Analysis

- 0BwOS WF-3, Revision 3; Auxiliary Building Leak Detection Sump Alarm Function Operability Surveillance

- 2BwOA PRI-8. Attachment C, Revision 103; Alignment of FP to Centrifugal Charging Pump Lube Oil Cooler
- IR 808885; Leak Detection Sump Not Causing RWCR Panel Alarm
- Braidwood UFSAR, Section 9.3.3; Equipment and Floor Drainage System

1R13 Maintenance Risk Assessments And Emergent Work Control

- Unit 0&1 Risk Assessment; Work Week July 21, 2008
- Protected Equipment List; 1B AF Pump
- 0BwOA ENV-7; Adverse Cooling Lake Conditions Unit 0; Revision 3
- OP-BR-108-101-1002, Attachment 5; Physical Posting of Protected Equipment; Revision 1
- OP-AA-108-101, Revision 005; Control of Equipment and System Status
- OP-AA-108-111, Revision 004; Adverse condition Monitoring and Contingency Planning
- WC-AA-101; On-line Work Control Process; Revision 14
- IR 799596; Incomplete List of Protected Equipment – 1A01PB/1MS018A; July 23, 2008 [NRC Identified]
- IR 803538; System Engineering PMID 169871-01 is Past Late
- IR 811615; Enhancement to Methodology for Posting Protected Equipment
- IR 818336; IEMA Identified Operations Not Logging lake Level
- Protected Equipment List; 2B DG Work Window; August 2008
- Braidwood Control Room Operating Logs for August 21-25, 2008

1R15 Operability Evaluations

- IR 810742; Smoke in 1B AF Pump Room From Oil in Exhaust Manifold Lagging
- IR 758402; Byron IR 757152 Diesel Driven Auxiliary Feedwater Pump Exhaust Manifold Insulation
- OP-AA-108-115, Revision 5; Operability Evaluation for Diesel Driven Auxiliary Feedwater Pump Exhaust Manifold Insulation
- OP-AA-108-115, Revision 6; Operability Determinations (CM-1)
- EP-AA-1001, Revision 21; Radiological Emergency Plan Annex for Braidwood Station
- IR 804195; NRC and IEMA Question Compliance with TS SR 3.7.12.4
- IR 804432; AF Diesel Cubicle Cooler Fan Breaker Failed to Close on Demand
- Braidwood Auxiliary Feedwater System Description

1R18 Plant Modifications

- LS-AA-104, Revision 005; Exelon 50.59 Review Process
- LS-AA-104-1000, Revision 004; Exelon 50.59 Resource Manual
- LS-AA-104-1003, Revision 001; Exelon 50.59 Screening form
- LS-AA-106, Revision 004; Plant Operations Review Committee
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1R19 Post Maintenance Testing

- WO 1137193-01; Retorque Valve Rocker Cover on 1B AF Pp; May 27, 2008
- WO 1137193-02; OP PM Testing; May 27, 2008
- WO 1137193-03; Replace Valve Rocker Cover on 1B AF Pp; July 22, 2008
- WO 1116915-01; OP Diesel Driven AF Pump Monthly; July 22, 2008
- WO 1145987-01; Diesel Driven Auxiliary FW Pump Monthly surveillance; July 22, 2008

- EC 385809; Request Engineering to Recommend a Gasket Sealant or Alternate Gasket Material to be Used on Aux Feed Pump Diesel Engine Valve Rocker Cover Gaskets; June 9, 2008.
- IR 799425; 1B AF Pump Insulation Loose After Maintenance; July 23, 2008 [NRC Identified]
- BwOP CV-3, Revision 26; Filling and Venting the CV System

1R22 Surveillance Testing

- 0BwOA ENV-7; Adverse Cooling Lake conditions Unit 0; Revision 3
- 2BwOSR 3.8.1.8-1, Revision 5; SAT 142-1 Crosstie to Bus 241 and DG 2A Crosstie to Bus 141 Surveillance
- 2BwOSR 3.8.1.2-2, Revision 022; Unit 2 1B Diesel Generator Operability Surveillance
- 20E-0-4001, Revision Y; Station One Line Diagram
- BwOP CV-33, Revision 3; Operation of a Centrifugal Charging Pump in Recirculation
- 2BwVSR 5.5.8.CV.2, Revision 4; ASME Surveillance Requirements for 2B Centrifugal Charging Pump and Check Valve 2CV8480B Stroke Test
- 1BwVSR 5.5.8.RH.2, Revision 8; ASME Surveillance Requirements for Residual Heat Removal Pump 1RH01PB
- IR 819351; NRC Identified Remediation Well #9 cover Removed [NRC Identified]
- IR 819353; NRC Identified Pond Pump Control Panel Latch Damaged [NRC Identified]
- IR 819603; NRC Reported VB-10 Moisture Sensor Not Flat [NRC Identified]
- OP-AA-108-103, Revision 002; Locked Equipment Program

1EP6 Drill Evaluation

- Braidwood July 23, 2008 PI Mini-Drill Handbook
- Drill - ENS Notification; July 23, 2008
- Drill – NARS Form; Utility Message No. 1; July 23, 2008
- Drill – NARS Form; Utility Message No. 2; July 23, 2008
- Drill – NARS Form; Utility Message No. 3; July 23, 2008
- Drill – NARS Form; Utility Message No. 4; July 23, 2008
- Drill – NARS Form; State Message No. 2; July 23, 2008
- Drill – NARS Form; State Message No. 3; July 23, 2008

2OS1 Access Control to Radiologically Significant Areas

- IR 775872; Challenge to Annual Liquid Release Curie Limit; May 15, 2008
- IR 767338; Hydrogen Alarms Occurring in Unit 2 Containment Cause Delays; April 24, 2008
- IR 788857; Alpha Contamination Monitoring Issues; June 20, 2008
- LS-AA-2150; Monthly Data Elements for NRC RETS/ODCM Radiological Effluent Occurrences; Revision 5
- NF-AA-390; Spent Fuel Pool Material Control; Revision 2
- RP-AA-460; Controls for High and Very High radiation Areas; Revision 15
- RP-AA-460-001; Controls for Very High Radiation Areas; Revision 1
- RP-AA-460-1002; Boundary and Postings Checklist; Revision 0
- RP-AA-460-1005; Secured High Radiation Area Controls; Revision 0
- RP-AA-550-1001; Hot Spot and Radiation Source Component Tracking; Revision 2
- RP-AP-460; Access to Reactor Incore Sump Area; Revision 2
- RP-BR-460; Controls for High and Very High Radiation Areas; Revision 15
- WO 01043833; Fuel Pool Physical Inventory; June 30, 2008\

2OS2 As-Low-As-Reasonably-Achievable Planning And Controls

- IR 773038; A2R13 Outage Dose Goal Exceeded; May 8, 2008
- LS-AA-126-1005; Check-in Self-Assessment Report: Radiation Protection; Revision 4
- RP-BR-2003-DAC; Hour Timekeeping, Calculating and Crediting Dose from Noble Gas Exposure; Revision 1

2PS1 Radioactive Gaseous And Liquid Effluent Treatment And Monitoring Systems

- IR 773067; ODCM – Unit 2 Gas Effluent Dose Projection Exceeds 0.3 millirem; May 8, 2008
- BwOP RE-5; Reactor Coolant Drain Tank Fill/Vent/Inert operations; Revision 4

2PS2 Radioactive Material Processing and Transportation

- IR 685047; High Total Organic Concentration Prevents Processing Of 0B Radwaste Monitor Tank; dated October 15, 2007
- IR 688180; Waste Processor Reaches Tritium Release Limits; dated October 23, 2007
- IR 700726; Radwaste Building Exhaust Fan Flow Rate Lower Than Expected; dated November 16, 2007
- IR 713742; Action Needed For Reduction Of Site Radioactive Materials; dated December 19, 2007
- IR 717836; Numerous Roadblocks Prevent Radwaste Processing; dated January 3, 2008
- IR 711902-02; Self Assessment Radioactive Material Processing and Transportation; dated July 16, 2008
- IR 719274; Audit NOSA-BRW-08-04, Chemistry Radwaste; Effluent and Environmental Monitoring; dated April 2, 2008
- IR 726904; Unclear Boundaries Between Vendor And Plant; dated January 25, 2008
- IR 739807; FRAC Tank Level Not Being Verified Monthly; dated February 22, 2008
- IR 745985; 2CV01DA Transfer Created an Airborne Condition; dated March 6, 2008
- IR 747866; Radwaste Processing Shut Down Due To Inoperable HVAC; dated March 11, 2008
- IR 784543-02; Self Assessment Radioactive Material Processing and Transportation; dated July 31, 2008
- IR 799975; Brine and Tanks In FRAC Farm 2 Need Disposition; dated July 24, 2008
- IR 786532; Solid Radwaste Bridge Crane Grab Jaw Camera Stopped Working; dated June 14, 2008
- IR 806043; Annual Radwaste Crane Inspection; dated August 11, 2008
- IR 807684; Radwaste Crane Operates Only In Low Speed; dated August 15, 2008
- IR 811420; 5 Gallon Drum "Soil Cuttings MW-159 Drum C" Lost Integrity; dated August 27, 2008
- Shipment RWS 07-53; Tanker Brine, October 29, 2008
- Shipment RWS 07-67; Shielded Dry Active Waste; November 16, 2007
- Shipment RWS 08-019; 55 Gallon Barrels; dated May 10, 2008
- Shipment RWS 08-026; Metal Octopus; dated September 18, 2008
- Shipment RWS 08-027; Resin; dated September 26, 2008
- BwOP WX-201; Dewatering the Spent Resin Storage Tanks; dated Revision 11
- BwOP WX-242; Resin Removal From Spent Fuel Pit Demineralizer; Revision 16
- RP-AA-600; Radioactive Material/Waste Shipments; Revision 10
- RP-AA-602; Packaging Of Radioactive Material Shipments; Revision 12
- RW-AA-100; Process Control Program For Radioactive Wastes; Revision 6
- RW-AA-102; Radwaste Storage Facility/Dry Active Waste Container Inspections; Revision 3

- RW-AA-104; Radwaste Storage Facility/Waste Container Inspections; Revision 1

4OA1 Performance Indicator Verification

- LS-AA-2150; Monthly Data Elements for NRC RETS/ODCM Radiological Effluents Occurrences; Revision 5

4OA2 Identification and Resolution of Problems

- OP-AA-102-103, Revision 002; Operator Work-Around Program

LIST OF ACRONYMS USED

AC	Alternating Current
AFW	Auxiliary Feedwater
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CO ₂	Carbon Dioxide
CV	Chemical and Volume Control
DOT	Department of Transportation
EACE	Equipment Apparent Cause Evaluation
EDG	Emergency Diesel Generator
FDS	Fire Damage State
FPP	Fire Protection Program
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Issue Report
MSPI	Mitigating System Performance Indexes
NPFA	National Fire Protection Association
NCV	Non-Cited Violation
NRC	U.S. Nuclear Regulatory Commission
PI	Performance Indicator
psid	Pounds Per Square Inch Differential
psig	Pounds Per Square Inch Gauge
SDP	Significance Determination Process
SI	Safety Injection
SRA	Senior Reactor Analyst
SX	Essential Service Water
TS	Technical Specification
UCSR	Upper Cable Spreading Room
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
WO	Work Order