

July 26, 2007

Mr. Christopher M. Crane
President and Chief Nuclear Officer
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: BRAIDWOOD STATION, UNITS 1 AND 2 NRC INTEGRATED INSPECTION
REPORT 05000456/2007004 AND 05000457/2007004

Dear Mr. Crane:

On June 30, 2007, 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 June 29, 2007, with Mr. G. Boerschig 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 violations 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 (NCVs) in accordance with Section VI.A.1 of the NRC's Enforcement Policy.

If you contest the subject or severity of a finding, 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 05000456/2007004 and 05000457/2007004
w/Attachment: Supplemental Information

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

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Senior Vice President - Nuclear Services
Vice President - Operations Support
Vice President - Licensing and Regulatory Affairs
Director Licensing
Manager Licensing - Braidwood and Byron
Senior Counsel, Nuclear, Mid-West Regional
Operating Group
Document Control Desk - Licensing
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REPORT 05000456/2007004 AND 05000457/2007004

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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: 05000456/2007004 and 05000457/2007004

Licensee: Exelon Generation Company, LLC

Facility: Braidwood Station, Units 1 and 2

Location: Braceville, IL

Dates: April 1 through June 30, 2007

Inspectors: S. Ray, Senior Resident Inspector
G. Roach, Resident Inspector
J. Cassidy, Health Physicist
A. Dunlop, Senior Reactor Engineer
M. Mitchell, Health Physicist
S. Orth, Health Physics Program Manager
D. Smith, Project Engineer
M. Perry, Illinois Emergency Management Agency (IEMA)

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

Enclosure

SUMMARY OF FINDINGS

IR 05000456/2007004, 05000457/2007004; 04/01/2007 - 06/30/2007; Braidwood Station, Units 1 & 2; Radiation Safety Event Followup Inspection.

This report covers a three-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. Two Green findings were identified by the inspectors. Both findings were considered non-cited violations (NCVs) of NRC regulations. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after 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-Revealing Findings

Cornerstone: Occupational and Public Radiation Safety

- Green. A finding of very low safety significance and an associated NCV of 10 CFR 20.1101(a) was identified by the inspectors for the licensee's failure to implement a radiation protection program commensurate with licensed activities and the ongoing radiological issues at the plant. Specifically, radiological controls were not effectively applied to secondary systems, which contained contaminated (tritium) fluids, to ensure that worker exposures and radiological effluents were fully monitored and controlled.

The finding is greater than minor because it was associated with the process and procedures attribute of the Occupational Radiation Safety cornerstone and affected the cornerstone objective to ensure the adequate protection of worker health and safety from exposure to radiation from radioactive material during nuclear reactor operation. Specifically, the inspectors determined that the finding did not involve unintended collective dose resulting from a deficiency in As-Low-As-Reasonably-Achievable (ALARA) planning, work control, or exposure control. The inspectors also determined that the finding did not involve an overexposure, the substantial potential for an overexposure, and did not compromise the licensee's ability to assess dose. Consequently, the inspectors concluded that the finding was of very low safety significance. Corrective actions taken by the licensee included characterizing secondary systems to determine tritium concentration and prescribing radiological coverage and contamination control requirements for each system based upon this characterization. The cause of the finding was related to a cross-cutting aspect in the area of Problem Identification and Resolution because the licensee did not address radiological safety issues and adverse trends in a timely manner, commensurate with their safety significance and complexity (P.1(d)). (Section 4OA3.2)

- Green. A finding of very low safety significance and an associated NCV of 10 CFR 20.1902(e) was identified by the inspectors for the failure to post areas in which licensed material is used or stored. Specifically, two waste water lagoons,

located within the Protected Area, and the Turbine Building each contained greater than 10,000 uCi of tritium and were not posted in accordance with 10 CFR 20.1902(e).

The finding is greater than minor because it was associated with the process and procedures attribute of the Occupational Radiation Safety cornerstone and affected the cornerstone objective to ensure the adequate protection of the worker health and safety from exposure to radiation from radioactive material during nuclear reactor operation. Specifically, the inspectors determined that the finding did not concern unintended collective dose resulting from a deficiency in ALARA planning, work control or exposure control. The inspectors also determined that the finding did not involve an overexposure, the substantial potential for an overexposure, and did not compromise the licensee's ability to assess dose. Consequently, the inspectors concluded that the Significance Determination Process (SDP) assessment for this finding was of very low safety significance. Corrective actions taken by the licensee included posting the lagoons and areas of the turbine building appropriately as "CAUTION, RADIOACTIVE MATERIAL(S)." The cause of the finding was related to a cross-cutting aspect in the area of Human Performance because the licensee did not use conservative assumptions in decision making (H.1(b)). (Section 4OA3.2)

B. Licensee-Identified Violations

None.

REPORT DETAILS

Summary of Plant Status

Unit 1 was operated at or near full power until June 27, 2007, when a lightning strike on an offsite power line created a grid disturbance resulting in an overcurrent trip of the 1D reactor coolant pump and subsequent automatic reactor trip. Unit 1 was restarted and synchronized to the grid the next day and was returned to full power over the remainder of the inspection period.

Unit 2 was operated at or near full power for the entire inspection period except that power was reduced to about 85 percent on May 12 through 14, 2007, for turbine valve testing.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (711111.01)

Readiness for Seasonal Susceptibilities

a. Inspection Scope

The inspectors monitored and reviewed the licensee's preparations for summer weather conditions. This effort was accomplished by verifying that the licensee had completed the requirements for summer readiness as required by Exelon Corporate Procedure WC-AA-107, "Seasonal Readiness." The inspectors also reviewed the Updated Final Safety Analysis Report (UFSAR) and the Technical Specifications (TS) to identify systems and components potentially susceptible to failure in high temperature conditions. The inspectors verified that the licensee had addressed these components in preparation for summer conditions. In addition, the inspectors selected the following risk-significant systems/areas for a detailed walkdown and review:

- lake screen house;
- refueling water storage tanks; and
- rod control system.

The inspectors also reviewed the licensee's procedures for coping with adverse electrical grid conditions, with emphasis on the licensee's communications protocol with grid operators. Documents reviewed during this inspection are listed in the Attachment.

This inspection constituted one sample of the inspection requirement for site readiness prior to the onset of extreme seasonal weather.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

Partial Walkdowns

a. Inspection Scope

The inspectors performed partial walkdowns of the accessible portions of risk-significant system trains during periods when the train was of increased importance due to redundant trains or other equipment being unavailable. The inspectors utilized the valve and electric breaker lists to determine whether the components were properly positioned and that support systems were aligned as needed. The inspectors also examined the material condition of the components and observed operating parameters of equipment to determine whether there were any obvious deficiencies. The inspectors reviewed Issue Reports (IRs) associated with the train to determine whether those documents identified issues affecting train function. The inspectors used the information in the appropriate sections of the TS and the UFSAR to determine whether the licensee had maintained the functional requirements of the system. The inspectors also reviewed the licensee's identification of and controls over the redundant risk-related equipment required to remain in service. Documents reviewed during this inspection are listed in the Attachment.

The inspectors completed three samples of this requirement by walkdowns of the following trains:

- 1B diesel generator (DG) with the 1A DG in a planned maintenance outage;
- 1B residual heat removal (RH) train with the 1A RH train in a planned outage; and
- 2A auxiliary feedwater (AF) train with the 2B AF pump in a corrective maintenance outage.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

Quarterly Inspection

a. Inspection Scope

The inspectors conducted fire protection walkdowns which were focused on availability, accessibility, and the condition of fire fighting equipment, the control of transient combustibles and ignition sources, and on the condition and operating status of installed fire barriers. The inspectors selected fire areas for inspection based on their overall contribution to internal fire risk, as documented in the Individual Plant Examination of External Events. Also reviewed was the revised Individual Plant Examination of External Events, which contained additional insights on selected fire areas that impact equipment potentially causing plant transient or adversely affecting safe shutdown capability. The inspectors used the Fire Protection Report, Revision 22, to determine: that fire hoses

and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and that fire doors, dampers, and penetration seals appeared to be in satisfactory condition.

The inspectors completed nine samples of this inspection requirement during the following walkdowns:

- Unit 1 steam tunnels and main steam isolation valve rooms (Zone 18.3-1);
- Unit 2 steam tunnels and main steam isolation valve rooms (Zone 18.3-2);
- Unit 1 containment mechanical penetration area, auxiliary building 364 elevation (Zone 11.3-1);
- Unit 2 containment mechanical penetration area, auxiliary building 364 elevation (Zone 11.3-2);
- Unit 1 auxiliary electrical equipment room (Zone 5.5-1);
- Unit 2 auxiliary electrical equipment room (Zone 5.5-2);
- 11 engineered safeguards features switchgear room (Zone 5.2-1);
- 12 engineered safeguards features switchgear room (Zone 5.1-1); and
- 21 engineered safeguards features switchgear room (Zone 5.2-2).

The inspectors verified that minor issues identified during the inspection were entered into the licensee's corrective action program. Documents reviewed during this inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06)

Internal Flood Protection Features

a. Inspection Scope

The inspectors reviewed Braidwood's flood analysis and design basis documents to identify design features important to internal flood protection, and flood protection measures in place to prevent or mitigate effects of internal flooding. For this sample, the inspectors focused on the 330-foot elevation of the auxiliary building, the essential service water (SX) pump rooms. The inspectors examined the flood doors, leak detection sumps, normal sumps, and cross connections between the auxiliary building and turbine building floor drain systems. This review represented one annual inspection sample. Documents reviewed during this inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

Quarterly Review of Testing/Training Activity

a. Inspection Scope

The inspectors observed operating crew performance during an evaluated simulator examination scenario involving a faulted steam generator and an anticipated transient without SCRAM following various instrument and controller failures.

The inspectors evaluated crew performance in the following areas:

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

Crew performance in these areas was compared to licensee management expectations and guidelines.

The inspectors verified that the crew completed the critical tasks listed in the simulator guide. The inspectors also compared simulator configurations with actual control board configurations. For any weaknesses identified, the inspectors observed the licensee evaluators to determine whether they also noted the issues and discussed them in the critique at the end of the session. Documents reviewed are listed in the Attachment. This review constituted one sample of this inspection requirement.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

Routine Inspection

a. Inspection Scope

The inspectors reviewed the licensee's overall maintenance effectiveness for selected plant systems. This evaluation consisted of the following specific activities:

- observing the conduct of planned and emergent maintenance activities where possible;
- reviewing selected IRs, open work orders, and control room log entries in order to identify system deficiencies;
- reviewing licensee system monitoring and trend reports;

- attending various meetings throughout the inspection period where the status of maintenance rule activities was discussed;
- conducting partial walkdowns of the selected system; and
- interviewing appropriate system engineers.

The inspectors also reviewed whether the licensee properly implemented Maintenance Rule, 10 CFR 50.65, for the affected systems. Specifically, the inspectors determined whether:

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

The above aspects were evaluated using the maintenance rule program and other documents listed in the Attachment. The inspectors also verified that the licensee was appropriately tracking reliability and/or unavailability for the systems. The inspectors verified that minor issues identified during the inspection were entered into the licensee's corrective action program. Documents reviewed in this inspection are listed in the Attachment.

The inspectors completed three samples in this inspection requirement by reviewing the following systems and equipment performance issues:

- SX subsequent to a through wall leak in Code Class III Piping;
- process radiation monitoring subsequent to numerous system communication failures; and
- DG subsequent to a governor failure on the 1A DG.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed the licensee's management of plant risk during emergent maintenance activities or during activities where more than one significant system or train was unavailable. The activities were chosen based on their potential impact on increasing the probability of an initiating event or impacting the operation of safety-significant equipment. The inspectors verified that the evaluation, planning, control, and work in progress met the requirements of 10 CFR 50.65, "Maintenance Rule." Specifically, the inspectors verified that the equipment was identified and controlled where appropriate, work was being conducted properly, and significant aspects of plant risk were being communicated to the necessary personnel.

The inspectors verified that minor issues identified during the inspection were entered into the licensee's corrective action program. This review determined whether those problems were being entered into the corrective action program with the appropriate characterization and significance; documents reviewed during this inspection are listed in the Attachment.

The inspectors completed five samples by reviewing the following activities:

- 1A DG work window with predicted severe weather period;
- emergent setpoint adjustment and regulator replacement in feedwater heater 16B normal level control valve circuit;
- offsite power cross-tied between Units during Unit 2 system auxiliary transformer outage;
- 1A DG emergent governor problem during Unit 2 system auxiliary transformer outage; and
- removal for maintenance of the 'G' fuel storage rack from the spent fuel pool.

b. Findings

No findings of significance were identified..

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors evaluated plant conditions and selected IRs for risk-significant components and systems in which operability issues were questioned. These conditions were evaluated to determine whether the operability of components was justified. The inspectors compared the operability and design criteria in the appropriate section of the UFSAR to the licensee's evaluations presented in the IRs and other documents to verify that the components or systems were operable. The inspectors also conducted interviews with the appropriate licensee system engineers and conducted plant walkdowns, as necessary, to obtain further information regarding operability questions. Documents reviewed as part of this inspection are listed in the Attachment.

The inspectors completed five samples by reviewing the following operability evaluations and conditions:

- Unit 2 high range containment radiation monitors impacted by temperature changes;
- 480 volt breaker ratings lowered in newly manufactured breakers;
- 1A DG fuel oil day tank sample indicated water and sediment following diesel oil storage tank cleaning;
- pin hole leak in an American Society of Mechanical Engineers (ASME) Code Class III pipe in the SX system; and
- Unit 1 intermediate range nuclear instrument, N35, overcompensated during reactor shutdown and subsequent reactor start-up.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed post-maintenance testing activities associated with important mitigating systems, barrier integrity, and support systems to ensure that the testing adequately demonstrated system operability and functional capability. The inspectors used the appropriate sections of the TS and UFSAR, as well as work orders for work performed, to evaluate the scope of the maintenance and to determine whether the post-maintenance testing was performed adequately, demonstrated that the maintenance was successful, and that operability was restored. The inspectors determined whether the tests were conducted in accordance with their procedures, including establishing the proper plant conditions and prerequisites, that the test acceptance criteria were met; and that the results of the tests were properly reviewed and recorded. The activities were selected based on their importance in demonstrating mitigating systems capability and barrier integrity. The inspectors verified that minor issues identified during the inspection were entered into the licensee's corrective action program. Documents reviewed as part of this inspection are listed in the Attachment.

Six samples were completed by observing post-maintenance testing of the following components:

- 1A DG following work window;
- 1A DG following mechanical governor replacement;
- 2B AF pump following the repair of a fuel oil leak;
- BT 7-11 switchyard circuit breaker following control power switch replacement;
- 1B DG following planned work window; and
- security DG following a planned work window.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed surveillance testing activities associated with important mitigating systems, barrier integrity, and support systems to ensure that the testing adequately demonstrated system operability and functional capability. The inspectors used the appropriate sections of the TS and UFSAR to determine whether the surveillance testing was performed adequately and that operability was restored. The inspectors determined whether the testing met the frequency requirements; that the tests were conducted in accordance with the procedures, including establishing the proper plant conditions and prerequisites; that the test acceptance criteria were met;

and that the results of the tests were properly reviewed and recorded. Activities were selected based on their importance in demonstrating mitigating systems capability, barrier integrity and the initiating events cornerstones. Documents reviewed as part of this inspection are listed in the Attachment.

Six samples were completed by observing and evaluating the following surveillance tests:

- Unit 1 K616B main steam isolation valve emergency closure slave relay test (Routine);
- 2B RH pump ASME test (Inservice Testing);
- 1B DG monthly test to verify no common mode failure with 1A DG governor problem (Routine);
- 1A AF pump simulated undervoltage conditions start (Routine);
- 1B containment spray pump slave relay and quarterly ASME test (Inservice Testing); and
- Unit 1 reactor coolant system leakrate evaluation (Leakrate).

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

The inspector observed the licensee performance during an emergency preparedness duty team drill. The inspectors observed activities in the control room simulator and the technical support center. The inspectors also attended the post-drill critiques in both facilities. The focus of the inspectors activities was to note any weaknesses and deficiencies in the drill performance and ensure that the licensee evaluators noted the same issues and entered them into the corrective action program. The inspectors placed emphasis on observations regarding event classification, notifications, protective action recommendations, site evacuation, and accountability activities. As part of the inspection, the inspectors reviewed the drill package and other documents listed in the Attachment.

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 Review of Licensee Performance Indicators for the Occupational Exposure Cornerstone

a. Inspection Scope

The inspectors reviewed the licensee's occupational exposure control cornerstone performance indicators (PIs) to determine whether or not the conditions surrounding the PIs had been evaluated, and identified problems had been entered into the corrective action program for resolution. These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.2 Plant Walkdowns and Radiation Work Permit Reviews

a. Inspection Scope

The inspectors reviewed licensee controls and surveys in the following three radiologically significant work areas within radiation areas, high radiation areas and airborne radioactivity areas in the plant and reviewed work packages which included associated licensee controls and surveys of these areas to determine if radiological controls including surveys, postings and barricades were acceptable:

- spent fuel pool inventory area;
- emergency core cooling system piping walkdown areas; and
- Unit 1 containment at-power entry.

These reviews represented one inspection sample.

The inspectors reviewed the radiation work permits (RWPs) and work packages used to access these three areas and other high radiation work areas to identify the work control instructions and control barriers that had been specified. Electronic dosimeter alarm set points for both integrated dose and dose rate were evaluated for conformity with survey indications and plant policy. Workers were interviewed to verify that they were aware of the actions required when their electronic dosimeters noticeably malfunctioned or alarmed. These reviews represented one inspection sample.

The inspectors walked down and surveyed (using an NRC survey meter) one of the three areas to verify that the prescribed RWP, procedure, and engineering controls were in place, that licensee surveys and postings were complete and accurate, and that air samplers were properly located. These reviews represented one inspection sample.

The adequacy of the licensee's internal dose assessment process for internal exposures greater than 50 millirem committed effective dose equivalent (CEDE) was assessed. There were no internal exposures greater than 50 millirem CEDE. These reviews represented one inspection sample.

The inspectors also 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. These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.3 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, Licensee Event Reports, and special reports related to the access control program to verify that identified problems were entered into the corrective action program for resolution. These reviews represented one inspection sample.

The inspectors reviewed nine corrective action reports related to access controls and high radiation area radiological incidents (non-PIs identified by the licensee in high radiation areas <1R/hr). Staff members were interviewed and corrective action documents were reviewed to verify that follow-up activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk based on the following:

- 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 non-cited violations (NCVs) tracked in the corrective action system;
- and
- implementation/consideration of risk significant operational experience feedback.

These reviews represented one inspection sample.

The inspectors evaluated the licensee's process for problem identification, characterization, prioritization, and verified that problems were entered into the corrective action program 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. These reviews represented one inspection sample.

The inspectors reviewed licensee documentation packages for all 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. There were no PI events since the last inspection. These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.4 Job-In-Progress Reviews

a. Inspection Scope

The inspectors observed the following three jobs that were being performed in radiation areas and high radiation areas for observation of work activities that presented the greatest radiological risk to workers:

- transient in-core probe inventory in the spent fuel pool;
- Unit 1 at-power entry; and
- emergency component cooling system venting and surveillance.

The inspectors reviewed radiological job requirements for these three activities including RWP requirements and work procedure requirements, and attended As-Low-As-Reasonably-Achievable (ALARA) job briefings. These reviews represented one inspection sample.

Job performance was observed with respect to these requirements to verify that radiological conditions in the work area were adequately communicated to workers through pre-job briefings and postings. The inspectors also verified the adequacy of radiological controls including required radiation, contamination, and airborne surveys for system breaches; radiation protection job coverage which included audio and visual surveillance for remote job coverage; and contamination controls. These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.5 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 verify that any procedure modifications did not substantially reduce the effectiveness and level of worker protection. These reviews represented one inspection sample.

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. The purpose of these discussions was 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. These reviews represented one inspection sample.

The inspectors conducted plant walkdowns to verify the posting and locking of entrances to high dose rate/high radiation areas, and very high radiation. These reviews represented one inspection sample.

b. Findings

No findings of significance were identified

.6 Radiation Worker Performance

a. Inspection Scope

During job performance observations, the inspectors evaluated radiation worker performance with respect to stated radiation protection work requirements and evaluated whether workers were aware of the significant radiological conditions in their workplace, the RWP controls and limits in place, and that their performance had accounted for the level of radiological hazards present. These reviews represented one inspection sample.

The inspectors reviewed radiological problem reports which found that 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. These problems, along with planned and taken corrective actions were discussed with the Radiation Protection Manager. These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.7 Radiation Protection Technician Proficiency

a. Inspection Scope

During job performance observations, the inspectors evaluated Radiation Protection Technician performance with respect to radiation protection work requirements and evaluated whether they were aware of the radiological conditions in their workplace, the RWP controls and limits in place, and if their performance was consistent with their training and qualifications with respect to the radiological hazards and work activities. These reviews represented one inspection sample.

The inspectors reviewed radiological problem reports which found that 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. These reviews represented one inspection sample.

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 Review of Blowdown Line and Tritium Remediation System Integrity

a. Inspection Scope

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:

- routine liquid effluent discharges to the river;
- operation of the pond remediation system;
- operations of and repairs to the remediation system for areas near vacuum breaker one;
- response to increased tritium levels in the secondary plant, lagoons, and cooling lake;
- installation of a remediation system for areas near the oil separator;
- vault liner repairs of vacuum breaker six; and
- periodic inspections of all of the vacuum breaker pits and remediation pumps.

The inspectors verified that minor issues identified during the inspection were entered into the licensee's corrective action program. Documents reviewed are listed in the Attachment. This inspection did not constitute a complete sample.

b. Findings

No findings of significance were identified.

.2 Inspection Planning

a. Inspection Scope

The inspectors reviewed the most current Radiological Effluent Release Report to verify that the program was implemented as described in Radiological Effluent TSs/Offsite Dose Calculation Manual (RETS/ODCM) and to determine if ODCM changes were made in accordance with Regulatory Guide 1.109 and NUREG-0133. The inspectors determined if the modifications made to radioactive waste system design and operation changed the dose consequence to the public. The inspectors verified that technical and/or 10 CFR 50.59 reviews were performed when required and determined whether radioactive liquid and gaseous effluent radiation monitor setpoint calculation methodology changed since completion of the modifications. The inspectors determined if anomalous results reported in the current Radiological Effluent Release Report were adequately resolved.

The inspectors reviewed RETS/ODCM to identify the effluent radiation monitoring systems and accompanying flow measurement devices, effluent radiological occurrence performance indicator incidents in preparation for onsite follow-up, and the UFSAR description of all radioactive waste systems. The inspectors reviewed the licensee's RETS/ODCM which provided the licensee's program for identifying potential contaminated spills and leakage and the licensee's process for control and assessment.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.3 Onsite Inspection

a. Inspection Scope

The inspectors walked-down the major components of the gaseous and liquid release systems (e.g., radiation and flow monitors, demineralizers and filters, tanks, and vessels) to observe current system configuration with respect to the description in the UFSAR, ongoing activities, and equipment material condition. These reviews represented one inspection sample.

The inspectors observed the routine processing (including sample collection and analysis) and release of radioactive liquid waste to verify that appropriate treatment equipment was used and that radioactive liquid waste was processed and released in accordance with procedure requirements. The inspectors reviewed routine processing (including sample collection and analysis) and release of radioactive gaseous effluent to verify that appropriate treatment equipment was used and that the radioactive gaseous

effluent was processed and released in accordance with RETS/ODCM requirements. The inspectors reviewed several radioactive gaseous effluent release permits, including the projected doses to members of the public. These reviews represented one inspection sample.

The inspectors reviewed the records of abnormal releases or releases made with inoperable effluent radiation monitors and reviewed the licensee's actions for these releases to ensure an adequate defense-in-depth was maintained against an unmonitored, unanticipated release of radioactive material to the environment. These reviews represented one inspection sample.

For unmonitored releases, (i.e., via typical, routine effluent pathways, or via spills, leaks, abnormal, or unexpected liquid or gaseous discharge, or other unusual occurrences), the inspectors verified that the licensee did perform an evaluation of the type and amount of radioactive material that was released and the associated projected doses to members of the public. These reviews represented one inspection sample.

Additionally, for any areas where spills, leaks, or other unusual occurrences (i.e., involving the spread of licensed radioactive material in and around the facility, equipment, or site) took place, the inspectors verified that these areas have been properly documented in the site's decommissioning file, as required by 10 CFR 50.75(g). These reviews represented one inspection sample.

The inspectors assessed the licensee's understanding of the location and construction of underground pipes and tanks, and storage pools (spent fuel pool) that could result in leakage of contaminated fluids to the groundwater as a result of degrading material conditions or aging of facilities. The inspectors appraised the licensee's capabilities (such as monitoring wells) of detecting spills or leaks and of identifying groundwater radiological contamination both on-site and beyond the owner controlled area. The inspectors discussed with the licensee, its understanding of groundwater flow patterns for the site, and in the event of a spill or leak of radioactive material, if the licensee's staff can estimate the pathway of a plume of contaminated fluid both onsite and beyond the owner controlled area. These reviews represented one inspection sample.

The inspectors reviewed the licensee's technical justification for changes made by the licensee to the ODCM as well as to the liquid or gaseous radioactive waste system design, procedures, or operation since the last inspection to determine whether the changes affect the licensee's ability to maintain effluents ALARA and whether changes made to monitoring instrumentation resulted in a non-representative monitoring of effluents. These reviews represented one inspection sample.

The inspectors reviewed a selection of monthly, quarterly, and annual dose calculations to ensure that the licensee properly calculated the offsite dose from radiological effluent releases and to determine if any annual RETS/ODCM (i.e., Appendix I to 10 CFR Part 50 values) were exceeded. These reviews represented one inspection sample.

The inspectors reviewed air cleaning system surveillance test results to ensure that the system was operating within the licensee's acceptance criteria. The inspectors

reviewed surveillance test results the licensee uses to determine the stack and vent flow rates. The inspectors verified that the flow rates were consistent with RETS/ODCM or UFSAR values. These reviews represented one inspection sample.

The inspectors reviewed records of instrument calibrations performed since the last inspection for each point of discharge effluent radiation monitor and flow measurement device and reviewed any completed system modifications and the current effluent radiation monitor alarm setpoint value for agreement with RETS/ODCM requirements. The inspectors also reviewed calibration records of radiation measurement (i.e., counting room) instrumentation associated with effluent monitoring and release activities and the quality control records for the radiation measurement instruments. These reviews represented one inspection sample.

The inspectors reviewed the results of the interlaboratory comparison program to verify the quality of radioactive effluent sample analyses performed by the licensee. The inspectors reviewed the licensee's quality control evaluation of the interlaboratory comparison test and associated corrective actions for any deficiencies identified. The inspectors reviewed the licensee's assessment of any identified bias in the sample analysis results and the overall effect on calculated projected doses to members of the public. In addition, the inspectors reviewed the results from the licensee's quality assurance audits to determine whether the licensee met the requirements of the RETS/ODCM. These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.4 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, Licensee Event Reports, and Special Reports related to the radioactive effluent treatment and monitoring program since the last inspection to determine if identified problems were entered into the corrective action program for resolution. 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 also reviewed corrective action reports from the radioactive effluent treatment and monitoring program since the previous inspection, interviewed staff, and reviewed documents to determine if the following activities were 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 non-cited violations tracked in the corrective action system; and
- implementation/consideration of risk significant operational experience feedback.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification (71151)

.1 Initiating Event Performance Indicators

a. Inspection Scope

Cornerstone: Barrier Integrity

The inspectors sampled the licensee's PI submittals for the periods listed below. The inspectors used PI definitions and guidance contained in Nuclear Energy Institute Document 99-02; "Regulatory Assessment Performance Indicator Guideline," Revision 4, to verify the accuracy of the PI data. The following PIs were reviewed for a total of four samples:

Unit 1

- reactor coolant system specific activity; and
- reactor coolant system leakage.

Unit 2

- reactor coolant system specific activity; and
- reactor coolant system leakage.

The inspectors reviewed licensee IRs, electronic logs, and other records for the period from April 1, 2006, through March 31, 2007, for each PI area specified above. The inspectors independently re-performed calculations where applicable. The inspectors compared the information acquired for each PI to the data reported by the licensee. The inspectors verified that minor issues identified during the inspection were entered into the licensee's corrective action program. 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 Identification and Resolution of Problems

a. Inspection Scope

As required by Inspection Procedure 71152, Identification and Resolution of Problems, and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed screening of all items entered into the licensee's corrective action program. This screening was accomplished by reviewing the description of each new Issue Report and attending selected daily management review committee meetings. Documents reviewed are listed in the Attachment to this report. Minor issues entered into the licensee's corrective action program as a result of the inspectors' observations are generally denoted in the Attachment. These activities were part of normal inspection activities and were not considered separate samples.

b. Findings

No findings of significance were identified.

.2 Semi-annual Review to Identify Trends

a. Inspection Scope

The inspectors conducted a review of licensee corrective action documents to identify trends that could indicate the existence of a more significant safety issue. For this review, the inspectors reviewed a sampling of equipment failures and other equipment problems for the period of January through May 2007 and then looked at the last five-year history to see if any of those failures were part of trend involving similar equipment in other trains or systems. This activity represented one inspection sample of the semiannual trend review. Documents selected for a more detailed review are listed in the Attachment.

b. Findings

No findings of significance were identified.

4OA3 Event Followup(71153)

.1 Unit 1 Reactor Trip - June 27, 2007

a. Inspection Scope

The inspectors responded to an automatic reactor trip of Unit 1 that occurred on June 27, 2007. The inspectors observed operator actions taken to verify that they were taken in accordance with licensee procedures, and reviewed unit and system indications to verify that system responses were as expected. The inspectors discussed the trip with operations, engineering, and licensee management personnel to gain an understanding of the event and assess followup actions. The inspectors later reviewed

the initial investigation report and observed the Plant Operating Review Committee to assess the detail of review and adequacy of the licensee's understanding of the apparent cause of the trip and proposed corrective actions prior to unit restart.

The licensee's investigation identified that the apparent cause of the reactor trip was a lightning strike to a 345 kilovolt offsite power line which created a large current spike in the Unit 1 switchyard resulting in multiple switchyard breakers opening and an overcurrent trip of the 1D reactor coolant pump. Subsequent to the 1D reactor coolant pump trip, the reactor tripped on low reactor coolant flow in the D reactor coolant loop as expected. The inspectors also reviewed the initial licensee notification to verify that it met the requirements specified in NUREG 1022, "Event Reporting Guidelines." The inspectors determined that the initial event notification contained errors regarding the response of the switchyard/main generator output breakers at the onset of the event and did not include details regarding the expected engineered safeguards feature actuation of the AF system. The licensee subsequently updated the event report to more accurately reflect the sequence of events.

The inspectors' observations were compared to the requirements specified in the procedure listed in the Attachment. The above represents one inspection sample.

b. Findings

No findings of significance were identified.

.2 Spill from West Lagoon

Background

On May 23, 2007, the licensee identified that approximately 1500 gallons of water from the West Lime Sludge Lagoon overflowed its banks due to high winds in the area. The lagoon is located within the restricted area and is a component of the licensee's waste treatment system. Sampling of the lagoon indicated tritiated water, at a concentration of approximately 75,000 pico-curies per liter (pCi/L), which the licensee had not expected. As a result, the licensee sampled the East Lime Sludge Lagoon, located adjacent to the West Lagoon, and also identified elevated levels of tritium at a concentration of approximately 2.6 million pCi/L. The licensee determined that the increased tritium level was due to leakage from one of the site's primary water storage tanks (via system valve leakage) into the turbine building equipment floor drains, which were subsequently routed to the East Lagoon. Upon identification of the leakage, the system was isolated from the lagoons. The licensee concluded that the West Lagoon became contaminated as a result of water transfers between the lagoons. The licensee discharged the contents of both lagoons to the Braidwood cooling lake, a recognized radioactive discharge path as provided in the ODCM. The licensee's preliminary dose estimate concluded that the potential dose to the public from the lagoon releases was a small fraction of one millirem.

a. Usage of East and West Lagoons

Inspection Scope

The inspectors reviewed the material that the licensee processed and stored in the East and West Lime Sludge Lagoons. The East Lagoon provides a surge volume for processing waste from the turbine building equipment and turbine building floor drains. Leakage from the primary water storage tank was collected and routed to the floor drain system and eventually to the East Lagoon. Residual water in the pumping systems cross contaminated the contents of the West Lagoon.

The inspectors reviewed the licensing basis for the lagoons, and assessed the activity of tritium contained within the lagoons, as provided in the UFSAR for compliance with the ODCM.

Findings

No findings of significance were identified.

b. Impact on Public Radiation Safety

Inspection Scope

The inspectors collected split samples from the cooling lake and the waste treatment lagoons for analysis by an independent laboratory. Additionally, the inspectors independently calculated the dose to the public from lagoon discharges to the Braidwood cooling lake and compared the results to 10 CFR Part 50, Appendix I limits. The inspectors determined that the dose to public was less than 1 millirem.

Findings

No findings of significance were identified.

c. Impact on Occupational Radiation Safety

Inspection Scope

The inspectors evaluated the contributors to tritium accumulation in the primary water system, the cross contamination of the demineralized water system, and the subsequent use of demineralized water as make-up for other secondary systems to determine whether the licensee was adequately implementing the requirements contained in 10 CFR Part 20 and plant procedures.

The inspectors reviewed the work history of select components within the secondary side of the plant. The inspectors focused on job planning, radiological job coverage for system breaches, and monitoring for internal dose of workers involved with system breaches of the primary water system to determine if the licensee was adequately implementing the requirements contained in 10 CFR Part 20 and plant procedures.

Findings

Introduction: A finding of very low safety significance and an associated Non-Cited Violation (NCV) of an NRC requirement was identified by the inspectors for the failure to implement the radiation protection program commensurate with the full extent of radiological issues at the plant.

Description: In November 2005, the licensee identified leaks from the blowdown line vacuum breaker valves that resulted in violations of NRC requirements for the unauthorized release of radioactive material to the environment (Inspection Report 05000456/2006008; 05000457/2006008; ML061450522). That condition caused the licensee to halt all liquid radioactive waste releases until the cause(s) was identified, repaired, and evaluated. During this process, the licensee made a decision to further restrict the number of liquid radioactive waste releases and to reduce the amount of tritium released from the plant each year through enhanced water recycling. Recycling waste water minimizes impurities in the waste water with the exception of tritium which cannot be removed from the water using conventional technologies because of its chemical form. The recycled water was then stored for future use in the primary water storage tanks. By April 2006, tritium concentration in the primary water system exceeded 10 million picocuries/liter (pCi/L) and by April 2007, the concentration was several hundred million pCi/L.

Historically, the primary water system has been an ultra-pure source of water that was supplied by processing a non-radiological water source and removing chemical impurities. The water was then used in the reactor coolant system and served as make-up water to the component cooling water system. The primary water system and other systems that came into contact with primary water as make-up were outside the radiologically controlled area and not evaluated by the licensee to assess system radiological impact.

The decision to operate the plant in "recycle" mode was implemented only after significant changes were made to the facility, including installing new equipment, modification of existing equipment, and creating new procedures. However, the licensee's radiation protection program failed to adequately monitor, assess, and control radiological hazards from the additional systems and areas of the plant that were impacted by tritium. Specifically, recycled plant water impacted plant systems and areas that had not previously been contaminated or had only trace levels of contamination. Additionally, the licensee's radiological controls were not effectively applied to these systems to ensure that worker exposures and radiological effluents were fully monitored and controlled. Recent work activities that adversely impacted secondary side contamination included a spectacle flange installed on the primary water system; a pump that was replaced in the waste water treatment building; and drip catch containers installed on the primary water system which routed the water to the turbine equipment floor drains.

Analysis: The failure to implement the radiation protection program commensurate with the full extent of radiological issues at the plant represents a performance deficiency as defined in NRC Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening." The inspectors determined that the issue was

associated with the Program/Process attribute of the Occupational Radiation Safety Cornerstone and affected the cornerstone objective to ensure the adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Therefore, the issue was more than minor and represented a finding which was evaluated using the Significance Determination Process (SDP).

Since the finding primarily involved the ability to protect workers from exposure to radiation, the inspectors utilized IMC 0609, Appendix C, "Occupational Radiation Safety SDP," to assess its significance. The inspectors determined that the finding did not involve unintended collective dose resulting from a deficiency in ALARA planning, work control or exposure control. The inspectors also determined that the finding did not involve an overexposure, the substantial potential for an overexposure, and did not compromise the licensee's ability to assess dose. Consequently, the inspectors concluded that the SDP assessment for this finding was of very low safety significance (Green).

As described above, the corrective actions taken in response to vacuum breaker valve leakage and resulting violations of NRC requirements included a new operating philosophy (recycle). The licensee implemented these corrective actions without assessing the impact on the radiation protection program. Consequently, the cause of this deficiency had a cross cutting aspect in the area of Problem Identification and Resolution. Specifically, the corrective actions taken by the licensee did not adequately address safety issues and adverse trends in a timely manner, commensurate with their safety significance and complexity (P.1(d)).

Enforcement: Title 10 CFR 20.1101(a) requires each licensee to develop, document, and implement a radiation protection program commensurate with the scope and extent of licensed activities and sufficient to ensure compliance with the provisions of this part. Contrary to the above, as of May 24, 2007, the work control process at the plant failed to evaluate the radiological impact of radioactive waste reduction activities for work on secondary systems that were contaminated with tritium.

Corrective actions taken by the licensee included characterizing secondary systems to determine tritium concentration and prescribing radiological coverage and contamination control requirements for each system based upon this characterization. Since the licensee documented this issue in its corrective action program (AR 00636122) and because the violation is of very low safety significance, it is being treated as an NCV (05000456/2007004-01; 05000457/2007004-01).

d. Notifying Workers of Hazards in the Workplace

Inspection Scope

The inspectors walked down areas of the turbine building and waste processing areas to identify whether the impact of tritium contamination was identified, evaluated, and communicated to the workers and to determine whether the licensee satisfied the requirements of 10 CFR Part 20.

Findings

Introduction: A finding of very low safety significance and an associated NCV of an NRC requirement was identified by the inspectors for the failure to post areas that contain radioactive material in accordance with 10 CFR 20.1902(e).

Description: The licensee notified the NRC of the increased concentration of tritium in the East Lagoon on May 24, 2007. The NRC assessed the concentration and volume and questioned whether the lagoons were posted in accordance with NRC requirements. The licensee responded by posting the access point to the lagoons and by reviewing the posting of other areas of the plant including the turbine building. A walkdown of the turbine building was conducted by the NRC inspectors and members of the licensee's staff during the afternoon of May 29, 2007. This walkdown identified that some tanks within the building were posted as "Radioactive Material" but other areas within the turbine building that contained tritium in excess of 10,000 micro-curies (uCi) in secondary-side systems were not posted. The inspectors concluded that the licensee had not adequately evaluated the radiological conditions to determine if the requirements of 10 CFR 20.1902(e) were met.

Analysis: The failure to post areas that contain radioactive materials in quantities that exceed specified values represents a performance deficiency as defined in NRC Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening." The inspectors determined that the issue was associated with the Program/Process attribute of the Occupational Radiation Safety Cornerstone and affected the cornerstone objective to ensure the adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Therefore, the issue was more than minor and represented a finding which was evaluated using the SDP.

Since the finding involved the ability to protect workers from exposure to radiation, the inspectors utilized IMC 0609, Appendix C, "Occupational Radiation Safety SDP," to assess its significance. The inspectors determined that the finding did not involve unintended collective dose resulting from a deficiency in ALARA planning, work control or exposure control. The inspectors also determined that the finding did not involve an overexposure, the substantial potential for an overexposure and did not compromise the licensee's ability to assess dose. Consequently, the inspectors concluded that the SDP assessment for this finding was of very low safety significance (Green).

Since the licensee had previously reviewed the conditions of the turbine building and concluded that posting the area would not benefit the workforce, this deficiency has a cross cutting aspect in Human Performance. Specifically, the licensee did not use conservative assumptions in decision making (H.1(b)).

Enforcement: Title 10 CFR 20.1902(e) requires licensees to post each area or room in which there is used or stored an amount of licensed material exceeding 10 times the quantity of such material specified in Appendix C to Part 20 with a conspicuous sign or signs bearing the radiation symbol and the words "CAUTION, RADIOACTIVE MATERIAL(S)" or "DANGER, RADIOACTIVE MATERIAL(S)." Contrary to the above, as of May 24, 2007, the lagoons contained greater than 10,000 uCi of tritium and were not

posted in accordance with 10 CFR 20.1902(e). Additionally, as of May 29, 2007, areas of the turbine building contained greater than 10,000 uCi of tritium and were not posted in accordance with 10 CFR 20.1902(e).

Corrective actions taken by the licensee included posting the lagoons and the turbine building with "CAUTION, RADIOACTIVE MATERIAL(S)." Since the licensee documented this issue in its corrective action program (AR 00636141) and because the violation is of very low safety significance, it is being treated as an NCV (05000456/2007004-02; 05000457/2007004-02).

40A5 Other Activities

(Closed) Unresolved Item (URI) (05000456/2005007-06; 05000457/2005007-06):
Review of Seismic/Safety Classification for the Essential Service Water Strainer Backwash System

During the 2005 Safety System Design and Performance Capability Inspection, the inspectors identified an unresolved item concerning SX strainer backwash system. The SX strainer backwash motor and isolation drain valve power supplies and control circuits were not safety-related or seismically qualified and following a seismic event these components could lose power. Without corrective actions to restore the SX strainer backwash function, the accumulation of sediment/debris present in the SX system would build up on the strainers and cause a loss of SX flow to safety-related equipment.

The licensee provided the inspectors with four points considered by the original Sargent and Lundy Engineers involved in Classification of the SX backwash system:

- Power can be restored to strainer backwash in the event of a loss of offsite power;
- Strainer backwash can be operated manually;
- There will be sufficient time to accomplish strainer backwash before adverse effects on the SX system; and
- Strainer backwash capability is expected to function after a seismic event.

Since the SX strainer backwash system was required to maintain the safety-related SX function following a seismic event, the inspectors were concerned that it should have been provided with seismically qualified control circuits and power supplies in accordance with 10 CFR Part 50 Appendix A, General Design Criteria No. 2 and No. 17. This issue was considered an URI pending NRC review of the plant licensing basis for the SX system backwash strainer function.

NRC Review and Conclusion:

Inspectors from the NRC Region III office, with support from the Office of Nuclear Reactor Regulation (NRR) staff, reviewed this issue. After a review of the plant's licensing basis, the NRR staff concluded that the SX strainer backwash system was operating within its design and licensing basis. As such, the classification of the SX strainer backwash system as nonsafety-related or non-seismically qualified was acceptable. However, if the SX strainer backwash system was needed under a loss of

power/seismic event, either its failure would not prevent the SX system from performing its safety-related function or proceduralized actions could be performed to operate the SX strainer backwash system under this scenario. This loss of SX function would be caused by allowing the strainer to become plugged without any means of cleaning the debris from the strainer without power to the backwash arm or the backwash motor-operated valves. In order to verify SX strainer backwash system would be able to be operated manually, the inspectors reviewed the licensee's corrective action (AR00367473) for Finding 05000456/2005007-05; 05000457/2005007-05, which concerned the failure to provide operators with equipment, procedures, and training to manually operate the SX system strainers to recover the loss of the SX automatic backwash capability.

The inspectors' review of the corrective actions identified several concerns with the work orders developed to address the issue for each of the strainers. These concerns included: there was no emergency, abnormal, or alarm response procedure to direct the operators to perform the work orders in the event of high strainer differential pressure, and a loss of non-safety power to the SX strainer backwash system could occur. As such, operators may not be aware of the work orders to address this scenario. The four work orders, each contained Steps 1.I and 1.K that referenced re-performing "Step No. 8"; however, this step did not exist in the work orders. The work orders instructions were copied from the strainer vendor manual, but step numbers were changed that were not identified during the review process. In addition, the work package did not identify the tools required to perform the intended actions. An initial response from the licensee indicated that the only tool required would be an appropriately sized wrench to remove the two nuts on top of the strainer backwash shaft. The inspectors questioned the need for ladders to reach the strainer, tools to remove the set screws on the dust cover and the thrust bearing attached to the backwash shaft.

Based on the inspectors concerns with the resolution of the finding, the licensee initiated several actions. First, a new procedure was issued, BwMP 3300-103, "SX Strainer Manual Backwash Operation on Loss of Power," which provided directions to operate the strainer backwash system without power. The procedure was based on the strainer vendor manual and provided sufficient guidance to perform the required operation. The only concern with the procedure was the lack of information on what tools would be necessary to perform the required actions. As previously discussed, scaffolding or ladders were needed to reach the strainer work area, and the associated tools necessary to perform the work were not identified such that the operation could be conducted in a timely manner. The licensee initiated Revision 1 to the procedure to include the necessary tools to manually operate the strainer to resolve this issue. Secondly, BwOP SX-6, "Essential Service Water Strainer Manual Operation," was revised to include the following statement under Limitations and Action, "In the event the SX strainer cannot be backwashed due to a loss of power, mechanical maintenance department should be contacted to perform a manual backwash of the strainer per BwMP 3300-103." This change provided the operators with an acceptable link to the maintenance action needed to perform these manual actions.

Based on the above qualitative assessment and the facts the inspectors determined no performance deficiencies or violations of regulatory requirements exist, no additional

enforcement action was warranted. The inspectors had no further concerns in this area. This unresolved item is closed.

Because the inspection was counted in another inspection report, these inspection activities do not represent an inspection sample for this report.

4OA6 Meetings

.1 Exit Meeting

The inspectors presented the inspection results to Mr. G Boerschig, and other members of licensee management at the conclusion of the inspection on June 29, 2007. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

.2 Interim Exit Meetings

Interim exit meetings were conducted for:

- Radioactive Gaseous And Liquid Effluent Treatment And Monitoring Systems program with Mr. G. Boerschig on May 4, 2007;
- Access Control to Radiologically Significant Areas with Mr. T. Couto on May 15, 2007;
- Event Follow-up for the spill of tritium from the West Lagoon and increase of tritium in the East Lagoon with Mr. T. Coutu on June 1, 2007; and
- Closure of URI 05000456/2005007-06; 05000457/2005007-06 with Mr. J. Perry on June 22, 2007.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

T. Coutu, Site Vice President
L. Coyle, Plant Manager
K. Aleshire, Emergency Preparedness Manager
D. Burton, Licensed Operator Requalification Training Lead Instructor
M. Cichon, Licensing Engineer
G. Dudek, Site Training Director
J. Gosnell, Project Manager
D. Gullott, Regulatory Assurance Manager
J. Knight, Nuclear Oversight Manager
R. Leasure, Radiation Protection Supervisor
T. McCool, Operations Director
T. Meents, RETS/REMP Analyst
J. Moser, Radiation Protection Manager
D. Myers, Acting Maintenance Director
J. Perry, Acting Manager, Regulatory Assurance
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

456/2007004-01; 457/2007004-01	NCV	Failure to implement a radiation protection program commensurate with the extent of plant radiological hazards. (Section 40A3.2)
456/2007004-02; 457/2007004-02	NCV	Failure to post areas that contain radioactive material. (Section 40A3.2)

Closed

456/2007004-01; 457/2007004-01	NCV	Failure to implement a radiation protection program commensurate with the extent of plant radiological hazards. (Section 40A3.2)
456/2007004-02; 457/2007004-02	NCV	Failure to post areas that contain radioactive material. (Section 40A3.2)
456/2005007-06; 457/2005007-06	URI	Review of Seismic/Safety Classification for the SX Strainer Backwash System

Discussed

None

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.

1R01 Adverse Weather Protection

IR 626734; NRC Identified 3 Ground Clusters in Unit 2 Transformer Yard; May 8, 2007 [NRC-Identified]

WC-AA-107; Seasonal Readiness; Revision 3

0BwOS XHT-A1; Unit Common High Temperature Equipment Protection Surveillance; Revision 12

EN-BR-402-0005; Extreme Heat Implementation Plan; Revision 1

0BwOA ELEC-1; Abnormal Grid Conditions; Revision 6

IR 597479; Nuclear Oversight Identified River Screen House Dredging not Budgeted for '07 Summer Readiness; February 28, 2007

IR 603041; Schedule Changes For Summer Readiness Work; March 13, 2007

IR 623734; Summer Readiness Check In Deficiency; April 30, 2007

1R04 Equipment Alignment

BwOP DG-E2; Electrical Lineup - Unit 1 1B Diesel Generator (DG); Revision 3

BwOP DG-M2; Operating Mechanical Lineup Unit 1 1B DG; Revision 13

BwOP RH-M2; Operating Mechanical Lineup - Unit 1 1B Train; Revision 8

BwOP AF-E2; Electrical Lineup - Unit 2 Operating; Revision 8

BwOP AF-M2; Operating Mechanical Lineup, Auxiliary Feedwater, (AF) Unit 2; Revision 9

1R05 Fire Protection

Braidwood/Byron Fire Protection Report Amendment 22; December 2006

IR 613021; IEMA Identified Limited Access to Fire Protection Extinguisher in Miscellaneous Electric Equipment Room; April 4, 2007 [IEMA-Identified]

IR 617695; NRC Identified Flex Conduit Pulled Out of 2AR23J; April 16, 2007 [NRC-Identified]

IR 632820; NRC Questioned Air Leakage at Penetration In Unit 2 Auxiliary Electrical Equipment Room; May 23, 2007 [NRC-Identified]

Fire Protection Report; Figure 2.3-13; Floor Plan at 383 Foot Elevation; Sheet 1 of 2

Fire Protection Report; Figure 2.3-13; Floor Plan at 383 Foot Elevation; Sheet 2 of 2

Fire Protection Report 2.3.18.5; Unit 1 Main Steam and AF Pipe Tunnel

(Fire Zone 18.3-1); Amendment 18

Fire Protection Report 2.3.18.6; Unit 2 Main Steam and AF Pipe Tunnel

(Fire Zone 18.3-2); Amendment 18

Fire Protection Report; Figure 2.3-14; Basement Floor Plan 364 Foot Elevation; Sheet 1 of 4

Fire Protection Report; Figure 2.3-14; Basement Floor Plan 364 Foot Elevation; Sheet 3 of 4

Fire Protection Report; Figure 2.3-8; Main Floor at Elevation 451; Sheet 1 of 4

Fire Protection Report; Figure 2.3-8; Main Floor at Elevation 451; Sheet 3 of 4

Fire Protection Report 2.3.5.9; Unit1 Auxiliary Electrical Equipment Room;

(Fire Zone 5.5-1); Amendment 22

Fire Protection Report 2.3.5.10; Unit1 Auxiliary Electrical Equipment Room;
(Fire Zone 5.5-2); Amendment 18
Fire Protection Report; Figure 2.3-10; Mezzanine Floor Plan at Elevation 426;
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Fire Protection Report; Figure 2.3-10; Mezzanine Floor Plan at Elevation 426;
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Fire Protection Report 2.3.5.1; Division 12 ESF [Engineered Safety Features] Switchgear
Room; (Fire Zone 5.1-1); Amendment 22
Fire Protection Report 2.3.5.3; Division 11 ESF Switchgear Room; (Fire Zone 5.2-1);
Amendment 18
Fire Protection Report 2.3.5.4; Division 21 ESF Switchgear Room; (Fire Zone 5.2-2);
Amendment 18

1R06 Flood Protection Measures

UFSAR Section 6.3.2.5; Subsection "Subsequent leakage from Components in Safeguards
System"; Revision 10
Calculation No. 3CB-0685-002; Auxiliary Building Flood Level Calculation; Revision 13
BwOP WF-M1; Operating Mechanical Lineup Unit 0 Aux Building Floor Drain System;
Revision 6
M - 48 Sheet 16; Diagram of Waste Disposal Turbine Building Floor Drains;
Revision AM
M - 48 Sheet 19; Diagram of Miscellaneous Sumps and Pumps; Revision 1
A - 206; Auxiliary Building Pump Floor Plan Area 6; Revision U

1R11 Licensed Operator Requalification Program

Out of the Box Scenario; Anticipated Transient Without SCRAM and Faulted Steam Generator
with Numerous Instrumentation and Control Anomalies

1R12 Maintenance Effectiveness

Maintenance Rule Performance Criteria; System Essential Service Water (SX)
Maintenance Rule Evaluation History; System SX; January 1, 2005 - December 31, 2006
Performance Monitoring Report - Reliability; System SX April 2005 - April 2007
IR 483005; 1A SX Pump Trip During Set Up For 1A DG Sequence Testing;
April 26, 2006
IR 542436; Maintenance Rule Expert Panel Review of Past Event is Needed; October 11, 2006
IR 446378; 1SX016A Does Not Fully Seat Electrically; January 26, 2006
IR 446389; 1SX027A Does Not Fully Seat Electrically; January 26, 2006
Maintenance Rule Performance Criteria; System Process Radiation Monitoring
Maintenance Rule Failure Report; Process Radiation Monitoring System April 2005 -
April 2007
2BwS RETS 2.1-2; Digital Channel Operability Test of 2PR02J and 2PR03J;
Revision 8
IR 336149; 2PR11J Is Reading In Alarm Status; May 18, 2005
IR 356435; Potential Trend for Steam Generator Blowdown Radiation Monitors;
July 25, 2005
IR 356634; 2PR08J In Alert For Approximately 50 Minutes; July 26, 2005
IR 436817; 1PR14J Goes Into Communications Failure Unexpectedly;
December 27, 2005
IR 461394; 1PR11J Particulate Channel Not Alarming RM-11; March 3, 2006

IR 624059; RM-11 Computer Application Stopped Responding; May 1, 2007
Maintenance Rule Performance Criteria; System Diesel Generator (DG)
Maintenance Rule Performance Monitoring; DG System; June 2005 - June 2007
Equipment Apparent Cause Evaluation (IR 624431); 1A Diesel Generator Failure to Control
Output Load; June 25, 2007
EC 365989; 1A Diesel Generator Failed Governor Actuator - Technical Evaluation and Part 21
Applicability
IR 575415; 1DG01KA Failed to Achieve Rated Speed & Volts in 10 Seconds;
January 4, 2007
IR 579950; 2DG01KB-Z Casing Flaw (Characterization); January 17, 2007
IR 585837; 1A Diesel Generator Failed to Reach Rated Speed & Volts After Repairs;
January 31, 2007
IR 586291; Deficiencies Noted On Replacement of 1A Diesel Generator Governor Actuator;
February 1, 2007
IR 587162; 1PL07J - 1A Diesel Generator Start Fuel Limit Setting Concern;
February 3, 2007
IR 589205; 2PL07J - Momentary Start System Malfunction Alarm 2A Diesel Generator;
February 8, 2007
IR 594929; 2B Diesel Generator Shutdown Unexpected During Hot Restart Procedure;
February 22, 2007
IR 621184; 2DG10MA - Flex Hose Cloth Covering is Degraded; April 24, 2007 [NRC-Identified]
IR 624431; 1DG01KA - Cannot Change Load on 1A Diesel Generator; May 2, 2007
IR 625498; 1A Diesel Generator Potential to Exceed Maintenance Rule Unavailability
Requirements; May 4, 2007
IR 635466; 1DG01KA - Past Operability of 1A Diesel Generator Previous Failure;
May 31, 2007

1R13 Maintenance Risk Assessments and Emergent Work Control

IR 621149; Genie Lift Left With Keys In and Unattended in Protected Area by Shaw; April 24,
2007 [NRC-Identified]
IR 624431; Cannot Change Load on 1A DG; May 2, 2007
IR 624537; Valve Handle is Loose and Appears to be Slightly Open; May 2, 2007
[NRC-Identified]
IR 625140; Quality Challenge to Mechanical Actuator for 1A DG; May 3, 2007
IR 625498; 1A DG Potential to Exceed Maintenance Rule Unavailability Requirements;
May 4, 2007
IR 633038; FME [Foreign Material Exclusion] Concern - Radiation Protection Technician
Performed Smear Survey in FME Area 1 Without Lanyard; May 23, 2007 [NRC-Identified]
BwMP 3100-086; DG Governor Actuator Replacement; Revision 3
1A DG work window - April 2007 - Protected Equipment; March 31, 2007
Special Procedure SPP-07-003; Movement of Heavy Loads in the Fuel Handling Building and
Spent Fuel Pool in Support of the Rack 'G' Repair Project; May 1, 2007
Special Procedure SPP-07-005; Vendor Procedure HPP1545-10, On-Site Rack Removal and
Handling Procedure for Rack 'G' Repair; May 11, 2007
OP-AA-108-111; Adverse Condition Monitoring and Contingency Plan - Spent Fuel Pool
Temperature Monitoring with Both Fuel Pool Cooling Trains Secured to Support Fuel Rack 'G'
and 'P' Removal/Installation Maintenance Activities; May 14, 2007
BwOP HD-17; Heater Drain Level Controller Operation; Revision 22

Unit 2 System Auxiliary Transformer Work Window - April 2007 - Protected Equipment;
April 23, 2007
IR 621744; SAT Neutral Resistor Bank Y Found With Jumper Removed;
April 25, 2007
EC 357298; Evaluate Out of Tolerance Condition for System Auxiliary Transformer 142-1
Neutral Grounding Resistor

1R15 Operability Evaluations

BWAP 330-10; Operability Determination for Containment High Range Detectors;
May 8, 1998
EP-AA-1001; Radiological Emergency Plan Annex for Braidwood Station; Revision 16
IR 609746; No Pulses Received on 2AR020J and 2AR021J; March 28, 2007
United States of America Standard N13.2-1969; USA Standard Guide for Administrative
Practices in Radiation Monitoring
IR 615967; Cutler Hammer Changed Voltage Rating on Molded Case Breakers;
April 11, 2007
Byron IR 616435; Molded Case Circuit Breaker Voltage Rating Concerns; April 12, 2007
IR 614249; 1PDS-DO061 Fuel Oil Transfer Pump Suction Strainer High; April 7, 2007
IR 619516; Unsat Results From the 1A Diesel Generator Diesel Oil Day Tank Sample;
April 20, 2007
Reg Guide 1.137; Fuel-Oil Systems for Standby Diesel Generators; October 1979
American Society for Testing and Materials (ASTM) D 4176-93; Standard Testing Method for
Free Water and Particulate Contamination in Distillate Fuels
ASTM D 2709-96; Standard Test Method for Water and Sediment in Middle Distillate Fuels by
Centrifuge
Analysts Inc. Laboratory Report: Diesel Fuel- ASTM D 975-98b Specification Testing;
April 12, 2007
Analysts Inc. Laboratory Report: Diesel Fuel- ASTM D 975-98b Specification Testing;
April 19, 2007
IR 644875; Intermediate Range Channel N-35 Is Overcompensated; June 27, 2007
IR 072983-01; Apparent Cause Evaluation - Reliability Criteria for Function SX1 Has Been
Exceeded; September 27, 2001
IR 628474; Through Wall Leakage Line 2SX27DA-10"; May 11, 2007
IR 628474-02; Operability Evaluation - Through Wall Leakage Line 2SX27DA-10";
May 16, 2007
IR 634082; 2SX27DA - Increased SX Leakage During SX Crosstie Flush Surveillance; May 26,
2007
IR 639118; 2SX057A - SX Piping Leak More Than Tripled Over 1 Shift; June 11, 2007
BRW-07-0102-M; Evaluation/Characterization of the Through Wall Leakage from Line
2SX27DA-10" Per Code Case N-513-1; May 16, 2007
Peach Bottom IR 584506; Through Wall Leak Found on Emergency Service Water Piping;
January 29, 2007
Peach Bottom IR 584506-04; Operability Determination - Through Wall Leak Found on
Emergency Service Water Piping; February 10, 2007
N-513-1; Cases of American Society of Mechanical Engineers (ASME) Boiler and Pressure
Vessel Code; Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy
Class 2 or 3 Piping Section XI, Division 1; March 28, 2001
OP-AA-108-115; Operability Determinations; Revision 1

Work Order 1028609-03; 2SX27DA-10" Schedule 40 Carbon Steel Pipe Lead Based Painted Code Wall Thickness Ultrasonic Test Measurement; May 11, 2007
M - 128; Diagram of SX Unit 2; Sheet 1
Generic Letter 90-05; Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2, and 3 Piping; June 15, 1990
Reg Guide 1.147; Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1; August 2005

1R19 Post-Maintenance Testing

IR 613424; NRC Concern: 1A DG Fuel Oil Cooler Leak at Drain Plug; April 5, 2007
[NRC-Identified]
IR 613694; High Oil and Jacket Water Temperatures on 1A DG During Test Run; April 5, 2007
IR 613712; Repair Valve to Support Troubleshooting of High Lube Oil Temperature; April 5, 2007
IR 613724; Repair Valve to Support Troubleshooting of High Lube Oil Temperature; April 5, 2007
IR 613824; 1A DG Tripped During Cooldown; April 6, 2007
BwVS 900-7; DG Post Relay Replacement Circuit Verification; Revision 5
Memo; Status of 1A DG Testing; May 3, 2007
BwVS 900-35; DG Governor Set-up Following Governor Replacement; Revision 5
BwOP DG-11; DG Startup; Revision 33
1BwOS DG-2A; 1A DG Overspeed Trip Test; Revision 1
BwOP AF-7; AF Pump 2B (Diesel) Startup on recirc; Revision 28
0BwOS IS-Q1; Unit Common Security DG Loaded Run Surveillance; Revision 11
BwOP SY-10; Placing a 345KV Air Circuit Breaker In Service; Revision 15
BwOP SY-27; Local Breaker Backup Removal and Return to Service; Revision 3

1R22 Surveillance Testing

1BwOSR 3.8.1.2-2; Unit One 1B DG Operability Monthly Surveillance; Revision 17
1BwOSR 3.3.2.8-644B; Unit One Engineered Safeguards Feature Actuation Signal Instrumentation Slave Relay Surveillance; Revision 2
1BwOSR 3.4.13.1; Unit One Reactor Coolant system Water Inventory Balance Surveillance; Revision 16
1BwVSR 5.5.8.CS.2; ASME Surveillance Requirements for 1B Containment Spray Pump and Check Valves 1CS003B, 1CS011B
IR 642164; Undesirable Variations in Reactor Coolant System Leakage Rate Program Output; June 19, 2007
IR 643918; Near miss - Wrong Procedure Brought to Brief for 1B Containment Spray ASME; June 25, 2007
IR 644053; TS Definition of Identified Leakage Contains Gray Area; June 25, 2007
Unit 1 Reactor Coolant System Leakrate Spreadsheet; September 30, 2004 through June 26, 2007
IR 644079; 1CS040B Difficult to Operate; June 25, 2007
1BwOSR 3.3.2.8-616B; Unit One Engineered Safety Features Actuation System Instrumentation Slave Relay Surveillance (B Train Steam Line Isolation - K616); Revision 2
IR 606092; 2RH011B Boric Acid Leakage Through Valve Seat; March 19, 2007
ER-AP-331 Boric Acid Corrosion Control Boric Acid Corrosion Control Program; Revision 3
2BwVSR 5.5.8.RH.2; ASME Surveillance Requirements for Residual Heat Removal Pump 2RH01PB; Revision 7

1BwOSR 3.3.2.3; Unit One Undervoltage Simulated Start of 1A AF Pump Surveillance;
Revision 2
20E-1-4030AF01; Schematic Diagram AF Pump 1A 1AF01PA; Revision AF
20E-1-4030AF14; Schematic Diagram AF Pump 1A and 1B Discharge Test Valves 1AF004A
and 1AF004B; Revision M
20E-1-4030EF01; Schematic Diagram ESF Sequencing & Actuation Cabinet Train A 1PA13J;
Revision V

1EP6 Drill Evaluation

IR 624524; Operations Instructor Failed Simulator Evaluation; May 2, 2007
IR 625558; Training: Licensed Operator Requalification Training simulator Out of the Box
Failure - Crew 1; May 2, 2007
Braidwood Station Second Quarter Emergency Preparedness PI Drill; May 2, 2007

20S1 Access control to Radiologically significant Areas

IR 640415; Safety Concern - 383 Foot Elevation Rad Waste Tunnel; June 14, 2007
[NRC-Identified]
Assignment Number 560706, Access Control to Radiologically Significant Areas; May 2, 2007
RWP 10007841; Exelon Operations Common Work; Revision 0
IR 483505; A1R12 Airborne Iodine-132 Issues From Unit 1 Containment; April 26, 2006
IR 513623; Emergency Hatch Egress Possible Compromise Safety Concern; July 26, 2006
IR 552811; Unit 2 High Radiation Sample Sink Overflowed; November 2, 2006
IR 579473; Key Discovered Missing During Inventory; January 16, 2007
IR 580785; High Radiation Area Key Not Returned to Radiation Protection; January 19, 2007
IR 612567; High Radiation Area Key Not Returned at the End of the Day; April 3, 2007
IR 626669; Plugged Drain in Radioactive Waste; May 8, 2007
IR 630373; Removal of Floor Plug Makes 383 Valve Aisle Accessible; May 16, 2007
IR 636952; Nuclear Oversight Identified: Radiation Worker Dynamic Learning Activity Not
Performed By All Participants; June 4, 2007
IR 640415; Safety Concern 383' Radioactive Waste Tunnel; June 14, 2007
IR 640382; Hose Running Across Contaminated Area Boundary Not Taped; June 14, 2007
NF-AA-390; Sample Pool Material Log; Revision 0
RP-BR-376-3002; Radiological Controls For Handling Items and Hanging Active Parts in the
Spent Fuel Pool; Revision 0
RP-AA-460; Controls for High and Very High Radiation Areas; Revision 11
RP-BR-460-1033; Secure High Radiation Controls; Revision 0
RWP 10007855; Exelon Fuel Handling Department Non-Outage Common Work; Revision 0
RWP 10007841; Exelon Operations Common Work; Revision 0
RWP 10007868; 2007 Transfer/Shipment of High Integrity Containers; Revision 0
RWP 10007866; Unit 1 Containment Entry Common Work; Revision 0

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

IR 619457; NRC Identified Concerns at Vacuum Breaker #6 and #9; April 17, 2007
[NRC-Identified]
IR 623742; NRC Identified Vacuum Breaker Remediation Well Pump Covers Not Bolted;
April 30, 2007 [NRC-Identified]
IR 623859; Items Identified During NRC Vacuum Breaker Walkdown; April 30, 2007
[NRC-Identified]
IR 624967; NRC Radiation Effluents Inspection Issues in 2006 Release Report;

May 2, 2007 [NRC-Identified]
The 2005 Braidwood Station; Units 1 and 2; Radioactive Effluent Release Report;
April 28, 2006
The 2006 Braidwood Station; Units 1 and 2, Radioactive Effluent Release Report;
April 30, 2006
CY-BR-170-301; Offsite Dose Calculation Manual; Revision 3
Permit Number 2006146; Gaseous Release Permit Report; May 2, 2007
Assignment Number 559534-04; Self-Assessment; Radioactive Gaseous and Liquid Effluent
Treatment and Monitoring; April 13, 2007
IR 287718; NOSA-BRW-05-08; Offsite Dose Calculation Manual, Radiological Environmental
Monitoring Audit Report; November 18, 2005
IR 465719; FRAC Tank Farm Berm Failure Resulting in Release of Tritiated Water Outside the
Intended Control Area; March 13, 2006
IR 497165; ODCM Flow Calculation Problem; June 6, 2006
IR 549132; A2R12 Gaseous Effluents 31 Day ODCM Limit at 105 Percent; October 26, 2006
IR 574048; 0PR02J Went into High Alarm During 0B Gas Decay Tank Release; December 31,
2006
IR 580326; Potential Addition to REMP; January 17, 2007
IR 583478; 2PR11J Gas Channel Step Change; January 25, 2007
IR 613426; Error in Offsite Dose Assessment Report; February 22, 2007
IR 613565; Elevated Tritium Level in the "F" Ditch; dated April 4, 2007
IR 615162; ODCM Manual Compositing Deficiency in Chemistry Department; April 10, 2007
IR 623742; Number 1 Vacuum Breaker Remediation Well Pump Covers Not Bolted,
April 30, 2007
IR 623859; Items Identified During NRC Vacuum Breaker Walkdown, April 30, 2007
BwOP WX526T1; Release Number L-06-005; Liquid Release Tank 0WX26T Release Form;
Revision 42
BwOP WX526T1; Release Number L-06-014; Liquid Release Tank 0WX26T Release Form;
Revision 42
BwOP WX526T1; Release Number L-06-023; Liquid Release Tank 0WX26T Release Form;
Revision 42
BwOP WX526T1; Release Number L-07-003; Liquid Release Tank 0WX26T Release Form;
Revision 42
BwOP WX526T1; Release Number L-07-011; Liquid Release Tank 0WX26T Release Form;
Revision 42
BwRP 6110-13T1; Release Number G-06-102; Containment Release Form; Revision 16
BwRP 6110-13T1; Release Number G-06-189 Containment Release Form; Revision 16
BwRP 6110-13T1; Release Number G-06-210; Containment Release Form; Revision 16
BwRP 6110-13T1; Release Number G-07-003; Containment Release Form; Revision 16
BwRP 6110-13T1, Release Number G-07-043; Containment Release Form; Revision 16
CR 475790; 2CB06AB (25B) Drain Cooler Relief Valve; 2DV021B Lifted During normal
Operations; April 6, 2006
Work Order 00715686; 0PR05J Calibration of Liquid Effluent Radiation Monitor; January 26,
2006
Work Order 00724305; 1PR28J Calibration of Effluent Gaseous Radiation Monitor; January 26,
2006
Work Order 00729920; Auxiliary Building Filter Plenum Vent System Total Bypass Leakage;
May 26, 2006
Work Order 00731221; 1PR10J Calibration of Liquid Effluent Radiation Monitor; June 15, 2006

Work Order 00732148; 1PR03J Calibration of Liquid Effluent Radiation Monitor; February 12, 2006
Work Order 00737639; 2PR01J Calibration of Auxiliary Building Bent Stack Effluent Radiation Monitor; June 9, 2006
Work Order 00747920; 1R-PR001 Calibration of Effluent Gaseous Radiation Monitor; April 29, 2006
Work Order 00778795; 0PR01J Calibration of Liquid Effluent Radiation Monitor; November 1, 2006
Work Order 00795564; 2PR03J Calibration of Liquid Effluent Radiation Monitor; January 26, 2007
Work Order 00866001; Fuel Handling Building Exhaust Plenum Vent Total Bypass Leakage Test; March 21, 2006
Work Order 0087130; 2PR01J Calibration of Effluent Gaseous Radiation Monitor October 30, 2006

4OA1 Performance Indicator Verification

IR 624077; NRC Identified Issue with Operator Logs Recorded Data; May 1, 2007
[NRC-Identified]

Braidwood Archival Operations Narrative Logs; Search Criteria: "3.4.13.1" or "ILR" or "Identified"; April 1, 2006, through March 31, 2007

4OA2 Identification and Resolution of Problems (71152)

Semiannual Trend Review

IR 128998; Failed Acceptance Criteria - Auxiliary Building Seismic Monitor Repeat Maintenance; October 25, 2002

IR 146003; B4 Trend Code - 0XR-EM008 Instrument Out of Tolerance; February 24, 2003

IR 209735; Seismic Monitoring Monthly Surveillance Failed; March 21, 2004

IR 258608; Evaluate A Replacement Seismic Monitor for Obsolete 0XR-EM02; September 30, 2004

IR 320769; Seismic Test Computer Failed to Operate; April 4, 2005

4OA3 Event Followup

Unit 1 Reactor Trip - June 27

IR 636122; Additional Issues NRC Wants Evaluated for Lagoon Spill; June 1, 2007
[NRC-Identified]

IR 637600; NRC Question on Dose Considerations from Turbine Building Equipment Drain Tank Vent; June 6, 2007 [NRC-Identified]

IR 645713; NRC Identified - Shortfalls with Emergency Notification System Notification; June 29, 2007 [NRC-Identified]

IR 646102; NRC Identified Insulation Dust on Floor By 14C Heater and 401 foot Elevation; June 29, 2007 [NRC-Identified]

Spill from West Lagoon

Plant Issue Resolution Documentation; Braidwood Waste Water Treatment Processing Options; Attachment A; dated May 25, 2007

Work Order 00912101 08; Create Contingency Work Request for Wastewater Treatment System; dated April 13, 2006

RP-AA-220; Bioassay Program; Revision 4

RP-AA-220; Attachment 3; Annual Bioassay Program Review; Revision 3; not dated

Annual Re-evaluation of Braidwood Nuclear Power Station's Prospective Evaluation for the Year 2006; not dated
RP-AA-376; Radiological Postings, Labeling, and Markings; Revision 2
RP-AA-376-1001; Radiological Posting, Labeling, and Marking Standard; Revision 3
RP-AA-376-2001; Labeling Containers and Marking of Material for Radiological Purposes; Revision 0
AR 00636141; Green NCV Failure to Post Rad Areas due to PW Contamination; dated June 1, 2007 (NRC Identified)
AR 00636122; Additional Issues NRC Wants Evaluated For Lagoon Spill; dated June 1, 2007; (NRC Identified)
AR 00635730; TR ODCM Compositor Needs Adjustment; dated May 31, 2007 (NRC Identified)
AR 00635749; Liquid Radwaste Operational Philosophy Change - UFSAR; dated May 31, 2007 (NRC Identified)
AR 00637600; NRC Question on dose Considerations from TE Tank Vent; dated June 6, 2007 (NRC Identified)
AR 00633717; Individuals Splashed with PW (Primary Water); dated May 24, 2007
AR 00632816; West Lagoon (c)TR Splashing to Surrounding Gravel Due to Wind; dated May 23, 2007
AR 00634115; Lake Exceeds Administrative Limit for Tritium; dated May 24, 2007
AR 00478730; WWT (Waste Water Treatment) West Lagoon Tritium Contamination Concern; dated April 14, 2006
BwCP 1003-6T1; Monthly Waste Water Treatment Discharge Form; Revision 7; dated January 2, 2007
BwCP 1003-6T1; Monthly Waste Water Treatment Discharge Form; Revision 7; dated March 6, 2007
BwCP 1003-6T1; Monthly Waste Water Treatment Discharge Form; Revision 7; dated April 9, 2007
BwCP 1003-6T1; Monthly Waste Water Treatment Discharge Form; Revision 7; dated May 2, 2007
AR 00629946; OPW01T - Water Leaking for Top of Tank; dated May 15, 2007
AR 00616048; Flange Leak on PW Vacuum Catch Tank Level Switch; OLE-PW037; dated April 12, 2007
Clearance Order 00052723 04; Install EC No. 364872/Spectacle Flange; not dated
AR 00634185; OPW087 Leaks By at 0.5 GPM; dated May 26, 2007
Liquid Release Permit Report; Waste Water Treatment; Permit Number 2007012; dated February 8, 2007
Liquid Release Permit Report; Waste Water Treatment; Permit Number 2007017; dated March 7, 2007
Liquid Release Permit Report; Waste Water Treatment; Permit Number 2007023; dated April 9, 2007
Liquid Release Permit Report; Waste Water Treatment; Permit Number 2007033; dated May 10, 2007
Liquid Release Permit Report; Abnormal Liquid Batch Release; Permit Number 2007046; not dated
Liquid Release Permit Report; Abnormal Liquid Batch Release; Permit Number 2007
UFSAR 11.2.2.2.6; Turbine Building Equipment Drain; Revision 10
UFSAR 11.2.2.2.7; Turbine Building Floor Drain; Revision 7
UFSAR 11.2.2.2.8; Turbine Building Fire and Oil Sump; Revision 7
UFSAR 11.2.2.2.10; Waste Treatment System; Revision 7

CY-BR-170-301; 10.2.1.2 Exelon Pond and Groundwater Remediation/Continuous Release Paths; Revision 4
CY-BR-170-301; 10.2.3.1.2.2 Release Limits; Revision 4
CY-BR-170-301; Table 12.3-1 Radioactive Liquid Waste Sampling and Analysis Program; Revision 4
BwOP TR-10; Processing Contamination Through Waste Water Treatment System; Revision 1
Liquid Release and Dose Summary Report; Release ID 1 All Liquid Release Types; dated May 28, 2007 14:59
Liquid Release and Dose Summary Report; Release ID 1 All Liquid Release Types; dated May 28, 2007 10:23
Liquid Release and Dose Summary Report; Release ID 1 All Liquid Release Types; dated May 28, 2007 10:15
Liquid Release and Dose Summary Report; Release ID 1 All Liquid Release Types; dated May 28, 2007 10:06
Liquid Release and Dose Summary Report; Release ID 1 All Liquid Release Types; dated May 28, 2007 09:57
Liquid Release and Dose Summary Report; Release ID 1 All Liquid Release Types; dated May 28, 2007 09:43
Liquid Release and Dose Summary Report; Release ID 1 All Liquid Release Types; dated May 28, 2007 09:38
Liquid Release and Dose Summary Report; Release ID 1 All Liquid Release Types; dated May 28, 2007 09:33
Liquid Release and Dose Summary Report; Release ID 1 All Liquid Release Types; dated May 28, 2007 14:59
Liquid Release and Dose Summary Report; Release Point 13 KR - Abnormal Liquid Batch Release; dated May 31, 2007 13:41
Liquid Release and Dose Summary Report; Release ID 3 Waste Water Treatment; dated May 31, 2007 12:40
Liquid Release and Dose Summary Report; Release ID 3 Waste Water Treatment; dated May 31, 2007 12:39
Liquid Release and Dose Summary Report; Release Point 13 KR - Abnormal Liquid Batch Release; dated May 31, 2007 15:10
Liquid Release and Dose Summary Report; Release Point 13 KR - Abnormal Liquid Batch Release; dated May 31, 2007 15:20
Liquid Release and Dose Summary Report; Release Point 13 KR - Abnormal Liquid Batch Release; dated May 31, 2007 15:17
Liquid Release and Dose Summary Report; Release ID 3 Waste Water Treatment; dated May 28, 2007 10:12
Liquid Release and Dose Summary Report; Release ID 3 Waste Water Treatment; dated May 28, 2007 10:04
Liquid Release and Dose Summary Report; Release ID 3 Waste Water Treatment; dated May 28, 2007 09:55
Liquid Release and Dose Summary Report; Release ID 3 Waste Water Treatment; dated May 28, 2007 09:42
Liquid Release and Dose Summary Report; Release ID 3 Waste Water Treatment; dated May 28, 2007 09:37
Liquid Release and Dose Summary Report; Release ID 4 Circulating Water Blowdown; dated May 28, 2007 10:21

Liquid Release and Dose Summary Report; Release ID 5 BP - Abnormal Liquid Batch Release; dated May 28, 2007 14:54

4OA5 Other Activities

AR00367473; Potential Enhancements to Strainer Backwash Response; dated August 27, 2005
AR00584642; PI&R FASA Id'd- Concern With Response to Sx Strainer Finding; dated January 26, 2007

BwMP 3300-103; SX Strainer Manual Backwash Operation on Loss of Power; Revisions 0, 1

BwAR 1-2-C2; SX Strainer Δ P High; Revision 5

1BwOA ELEC-4; Loss of Offsite Power Unit 1; Revision 101

1BwOA PRI-8; Essential Service Water Malfunction Unit 1; Revision 102

BwOP SX-6; Essential Service Water Strainer Manual Operation; Revision 6, 7

WP00845500; Contingency 1A SX Strainer Manual Backwash on Loss of Power

WP00845501; Contingency 1B SX Strainer Manual Backwash on Loss of Power

WP00845507; Contingency 2A SX Strainer Manual Backwash on Loss of Power

WP00845509; Contingency 2B SX Strainer Manual Backwash on Loss of Power

Other Inspector-Identified Minor Issues

IR 612440; NRC Identified Thumbscrew for 120 Volt Motor Control Center Panel Missing; April 3, 2007

IR 615722; NRC Identified 2VA02J Panel Door Bottom Clip Missing; April 11, 2007

IR 616378; Door Handle on D-205 Sticks; April 12, 2007

IR 619433; IEMA Inspector Identified 3 Items During Walkdowns; April 16, 2007

IR 627291; N-42 Rate Mode Switch Needs Repair/ Replacement; May 9, 2007

IR 638605; 0VC01JA - NRC Identified Control Room Ventilation Control Panel Doors Not Latched; June 8, 2007

IR 641612; Two Outside Phone Lines Inoperable in the Technical Support Center; June 18, 2007

IR 642009; IEMA Inspector Identified "Sparkle" Bottle on 1CV8104; June 19, 2007

IR 642819; IEMA Inspector Identified Door D-170 Not Latching; June 21, 2007

IR 645456; Technical Support Center IEMA Phone Out of Service; June 28, 2007

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
AF	Auxiliary Feedwater
ALARA	As-Low-As-Reasonably Achievable
AR	Action Request
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
BwAP	Braidwood Administrative Procedure
BwIS	Braidwood Instrument Surveillance
BwMP	Braidwood Maintenance Procedure
BwOA	Braidwood Abnormal Operating Procedure
BwOP	Braidwood Operating Procedure
BwOS	Braidwood Operating Surveillance
BwOSR	Braidwood Operating Surveillance Requirement Procedure
BwVS	Braidwood Engineering Surveillance Procedure
BwVSR	Braidwood Engineering Surveillance Requirement Procedure
CEDE	Committed Effective Dose Equivalent
CFR	Code of Federal Regulations
DG	Diesel Generator
DRS	Division of Reactor Safety
FME	Foreign Material Exclusion
GPM	Gallons Per Minute
IEMA	Illinois Emergency Management Agency
IMC	Inspection Manual Chapter
IR	Issue Reports
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
PARS	Publicly Available Records
PI	Performance Indicator
RETS/ODCM	Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual
RH	Residual Heat Removal
RWP	Radiation Work Permit
SDP	Significance Determination Process
SX	Essential Service Water
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item