July 20, 2004

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 05000456/2004004;
05000457/2004004

Dear Mr. Crane:

On June 30, 2004, 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 findings which were discussed on July 7, 2004, with Mr. T. Joyce and other members of your staff.

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

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

If you contest the subject or severity of a Non-Cited Violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission - Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector Office at the Braidwood facility.

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Sincerely,

/RA/

Ann Marie Stone, Chief
Branch 3
Division of Reactor Projects

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

Enclosure: Inspection Report 05000456/2004004; 05000457/2004004
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
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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:	05000456/2004004; 05000457/2004004
Licensee:	Exelon Generation Company, LLC
Facility:	Braidwood Station, Units 1 and 2
Location:	35100 S. Route 53 Suite 84 Braceville, IL 60407-9617
Dates:	April 1 through June 30, 2004
Inspectors:	S. Ray, Senior Resident Inspector N. Shah, Resident Inspector C. Phillips, Senior Operator Licensing Examiner J. Cameron, Project Engineer T. Tongue, Project Engineer J. House, Radiation Specialist D. Nelson, Radiation Specialist
Observers:	P. Smith, Illinois Emergency Management Agency Resident C. Roque-Cruz, Reactor Engineer
Approved by:	Ann Marie Stone, Chief Branch 3 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000456/2004004, 05000457/2004004; 04/01/04 - 06/30/04; Braidwood Station, Units 1 & 2; Adverse Weather Protection and Operability Evaluations.

This report covers a 3-month period of baseline resident inspection and an announced baseline inspection on radiation protection. In addition, an inspection in accordance with Temporary Instruction (TI) 2515/156, "Onsite Power System Operational Readiness," was conducted. The inspection was conducted by Region III inspectors and the resident inspectors. Two Green findings associated with two Non-Cited Violations were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be "Green" or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. Inspector-Identified and Self-Revealed Findings

Cornerstone: Initiating Events

- Green. The inspectors identified a finding of very low safety significance when unauthorized loose scaffold material was found in the Unit 2 transformer yard during a period of frequent high winds, severe thunderstorm warnings, and tornado watches. Once identified to licensee management, the material was rapidly removed from the area. The causes for the finding were related to the cross-cutting areas of Human Performance, because operators failed to identify the material despite numerous walkdowns of the area using a procedure that specifically directed them to look for that type of material, and Problem Identification and Resolution because the implementation of corrective actions for two previous loss of offsite power events and a Non-Cited Violation, all involving loose material in the transformer yards, did not prevent this finding.

  The finding was more than minor because it increased the likelihood of a loss of offsite power or reactor trip event. The finding was of very low safety significance because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigating equipment or functions would not be available. This issue was determined to be a non-cited violation of Technical Specification 5.4.1.a for failure to follow procedures. (Section 1R01.1)

Cornerstone: Barrier Integrity

- Green. The inspectors identified a finding of very low significance when they determined that the 0A hydrogen recombiner had been inoperable for at least 43 days, longer than its Technical Specifications allowed outage time of 30 days. The train was inoperable because of a combination of conditions which degraded it to the point where it could not be relied upon to perform its intended safety function. Specifically (1) the temperature controller for the reaction chamber temperature was erratic, causing unexpected trips of the heater breaker; (2) a procedure revision to direct operators to gradually bring up

reaction chamber temperature by manually adjusting the temperature controller was not completed in a timely manner, nor was training held on the procedure; and (3) annunciators intended to alert operators to a trip of the heater breaker, or other malfunctions of the recombiner, were not functional. At the time the finding was identified, the temperature controller had already been replaced and tested, the procedure revision had been incorporated, and the repairs of the annunciators had been scheduled. The causes of this violation were related to the cross-cutting areas of Human Performance, because engineering personnel did not properly assess operability, and Problem Identification and Resolution, because untimely corrective actions resulted in the recombiner being inoperable for longer than the allowed outage time in the Technical Specifications.

The finding was more than minor because it affected the barrier integrity cornerstone objective of providing reasonable assurance that the physical containment barrier would protect the public from radio nuclide releases caused by accidents or events. The finding was of very low safety significance because the hydrogen recombiner system is not a significant contributor to the large early release frequency for pressurized water reactors with large dry containments. This issue was determined to be a non-cited violation of Technical Specification 3.6.8 for failure to maintain the hydrogen recombiner operable. (Section 1R15.1)

B. Licensee-Identified Violations

No findings of significance were identified.

REPORT DETAILS

Summary of Plant Status

Unit 1 operated at or near full power for the entire inspection period except that power was reduced to 85 percent from April 17 through April 19, 2004, for turbine and governor valve testing.

Unit 2 operated at or near full power for the entire inspection period except that power was reduced to 85 percent on May 15 for turbine and governor valve testing, and to about 85 percent on June 1, June 13, and June 27, 2004, for load following. Turbine and governor valve testing was also conducted during the June 27, 2004, load reduction.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

.1 Readiness For Impending Adverse Weather Conditions

a. Inspection Scope

Between May 9 and May 23, 2004, the licensee entered its abnormal operating procedures for adverse weather seven times for thunderstorm warnings and tornado watches. The inspectors reviewed the licensee's readiness and response to those conditions, conducted plant walkdowns, especially of outside areas near the transformers, and reviewed the corrective actions taken for previous issues identified in this area. Documents reviewed as part of this inspection are listed in the Attachment. The inspectors verified that minor issues identified during this inspection were entered into the licensee's corrective action program. This activity constituted one sample for this inspection requirement.

b. Findings

Introduction: The inspectors identified a repeat Non-Cited Violation (NCV) of Technical Specifications (TS) 5.4.1.a having a very low safety significance (Green) for unauthorized storage of scaffold parts and other material inside of a designated material storage exclusion area around the Unit 2 transformers. This finding also involved the cross-cutting areas of Human Performance and Problem Identification and Resolution.

Description: On about April 23, 2004, the licensee erected a significant amount of scaffolding around the Unit 2 station auxiliary transformers (SATs) and associated bus ducts from the transformers to the auxiliary building for scheduled work on the SATs. On about May 7, 2004, the scaffolding around the SATs was removed, but the scaffolding around the bus ducts was left in place. The scaffolding pieces that had been around the SATs were left inside the transformer yard. Most of the pieces were in racks, but several pieces of platforms, ladders, wooden kick boards, etc. were left laying on the ground

loose. The pieces were not tied down or secured; therefore, could become missiles during high winds or tornadoes. In addition, a rack of compressed gas cylinders was also left inside of the transformer yard exclusion area. The licensee had deferred the remaining work to remove the material due to manpower constraints.

On the evening of May 9, 2004, the operators received a thunderstorm warning, entered the appropriate abnormal operating procedures, and carried out the actions directed by those procedures. The next day, the inspectors noticed the loose scaffold parts, as well as the tall scaffold still erected around the buses, and asked the auxiliary power (AP) system engineer when the scaffolding was going to be removed. The engineer did not provide an answer.

The plant experienced adverse weather conditions (high winds, thunderstorm warnings, and tornado watches) on six more occasions between May 9 and May 23, 2004. On at least two of those occasions, when the plant operators notified the inspectors that they had entered the abnormal operating procedure, the inspectors reminded the operators that there was still a significant amount of scaffolding and scaffolding parts near the Unit 2 transformers.

As a result of two previous loss of offsite power events caused by loose material near the transformers (Licensee Event Reports [LERs] 05000457/1996-001-00 and 05000456/1998-003-00) as well as an NCV and associated Green finding (05000456/2000005-01), the licensee established Transformer Material Exclusion Areas around the Unit 1 and Unit 2 transformers. The administrative control procedures for the exclusion areas required, in part, that no material may be brought into or stored inside of the areas unless prior permission was received from the shift manager. The inspectors could find no record of such permission being granted for the storage of scaffold parts inside the exclusion area and, during an interview with a shift manager, he stated that he was not aware of any permission being granted. The outside of the areas were marked with placards stating the administrative requirement from an outdated plant procedure that had been superceded by a corporate procedure.

The inspectors determined that the licensee had at least 20 opportunities to identify the unauthorized material stored in the exclusion area. Each of the seven times the licensee entered 0BwOA ENV-1, “Adverse Weather Conditions Unit 0,” one of the steps directed by that procedure was to eliminate threats to offsite power sources by securing or removing any loose material and equipment from around the plant exterior that could impact offsite power availability. A note in the procedure specifically listed scaffold material as one of the types of materials that could present a hazard during high winds. In addition, the 2B diesel generator (DG) was inoperable for the period of May 16 through May 21, 2004, while the scaffolding was in the exclusion area. As one of the compensatory actions for a DG being out of service, the operators normally conduct walkdowns of the switchyard and transformer areas to monitor the condition of the offsite power sources. By reviewing the operator logs, the inspectors identified at least thirteen occasions during that period where operators walked down the Unit 2 transformer yard.

On May 27, 2004, the inspectors walked down the area with the Maintenance Director and Mechanical Maintenance Manager to point out the specific concerns. As a result, the loose scaffold material was removed later that day. All of the remaining erected scaffolding and compressed gas cylinders were removed by May 29, 2004. The licensee issued Condition Report (CR) 224258 to document and track the issue. The licensee also issued CR 224281 to document the issue with the outdated procedure reference on the placards.

Analysis: The inspectors determined that leaving loose scaffold material stored inside of the transformer exclusion area was a performance deficiency warranting a significance evaluation in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Disposition Screening," issued June 20, 2003. The loose material near the Unit 2 transformers increased the likelihood of a unit trip or loss of an offsite power feed during high winds or tornadoes. The inspectors determined that the finding was more than minor because it: (1) involved the protection against external factors and human performance attributes of the Initiating Events cornerstone; and (2) affected the cornerstone objective of limiting the likelihood of those events that upset plant stability during power operations.

The inspectors determined that the finding also involved the cross-cutting area of Human Performance, in that the licensee missed numerous opportunities to self-identify the material during operator walkdowns of the area. The inspectors determined that the finding also involved the cross-cutting area of Problem Identification and Resolution because the corrective action of establishing material exclusion areas due to previous loss of offsite power (LOOP) events and a previous finding were not adequately implemented and a repeat finding was identified.

The inspectors determined that the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," because the finding was associated with an increase in the likelihood of an initiating event. The inspectors answered "no" to all the SDP Phase 1 Screening Worksheet questions in the Initiating Event column, therefore, the finding screened out as Green or of very low safety significance. Specifically, the inspectors determined that it was unreasonable to assume that the material could simultaneously affect both the SATs, which could affect the offsite power supply to mitigating equipment, and the main power transformers, which could cause a plant trip.

Enforcement: Technical Specification 5.4.1.a stated that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Section 6 of that Regulatory Guide, "Procedures for Combating Emergencies and Other Significant Events," specifically addressed the need to have procedures for acts of nature, including tornadoes. The licensee implemented that requirement, in part, with 0BwOA ENV-1, "Adverse Weather Protection Unit 0." Step 3.b. of Revision 101 of 0BwOA ENV-1 directed operations and security personnel to eliminate threats to offsite power sources by securing or removing any loose material and equipment from around the plant exterior that could impact offsite power availability. Contrary to the above, on seven occasions between May 9 and May 23, 2004, the licensee implemented 0BwOA ENV-1 and did not

secure or remove loose scaffold material in the Unit 2 transformer yard. Such material blowing into a transformer could have impacted offsite power or mitigating system availability. Because the failure to effectively implement procedure 0BwOA ENV-1 was of very low safety significance, has been corrected, and has been entered into the licensee corrective action program as CR 224258, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy. (NCV 05000457/2004004-01)

.2 Readiness For Seasonal Susceptibilities

a. Inspection Scope

The inspectors reviewed the licensee's seasonal preparations for operation during the summer months. This was primarily accomplished by verifying that the licensee had completed the requirements for summer readiness as documented in Exelon Nuclear Procedure OP-AA-108-109, "Seasonal Readiness," Revision 1. The inspectors also reviewed the Updated Final Safety Analysis Report (UFSAR), TS, and other design-bases documents to identify those components that were "at risk" during the summer months due to high temperatures. The inspectors verified that the licensee had addressed these components in preparation for summer operation. In addition, the inspectors selected the following risk-significant support systems for specific review:

- Units 1 and 2 DG ventilation and jacket water subsystems; and
- Units 1 and 2 service water supply to the room and oil coolers for the emergency core cooling system (ECCS) pumps.

These components constituted two samples of this inspection requirement.

The inspectors also reviewed several CRs documenting problems with heat exchangers, room temperatures, or adverse weather control, to determine whether these issues were being properly addressed in the licensee's corrective action program. The inspectors also verified that minor issues identified during these inspections were entered into the licensee's corrective action program. Documents reviewed as part of this inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

.1 Complete Walkdowns

a. Inspection Scope

The inspectors performed a complete system walkdown of the safety and risk-significant electrical power supplies to Units 1 and 2. This included: the Units 1 and 2 switchyard;

main, unit, and system auxiliary transformers; DGs; and the associated electrical distribution to the safety and risk-significant 6.9 kilovolt (kV) and 4.1 kV electrical buses and 480 volt (V) motor control centers. This walkdown represented one inspection sample. This system was selected because it was considered both safety and risk-significant in the licensee's probabilistic risk analysis.

In addition to the walkdown, the inspectors reviewed the following:

- selected abnormal and emergency operating procedures concerning a LOOP;
- the UFSAR, TS, and other selected design bases documentation regarding offsite and onsite electrical distribution and LOOP events;
- outstanding and/or completed temporary or permanent modifications to the system; and
- outstanding system work orders (WOs).

The inspectors also reviewed several selected CRs to verify that issues were being properly addressed in the licensee's corrective actions program. The inspectors also verified that minor issues identified during this inspection were entered into the licensee's corrective action program. Documents reviewed as part of this inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

.2 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 checklists, as well as other documents listed in the Attachment, to verify that the components were properly positioned and that support systems were lined up as needed. The inspectors also examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors reviewed outstanding WOs and CRs associated with the train to verify that those documents did not reveal issues that could affect train function. The inspectors used the information in the appropriate sections of the TS and the UFSAR to determine the functional requirements of the system. The inspectors also reviewed the licensee's identification of and the controls over the redundant risk-related equipment required to remain in service. The inspectors verified that minor issues identified during this inspection were entered into the licensee's corrective action program. The inspectors completed four samples of this requirement by walkdowns of the following trains:

- 2B DG while the 2A DG was unavailable during planned maintenance;

- 2B diesel-driven auxiliary feedwater (AF) pump while it was protected equipment during planned maintenance on the auxiliary building ventilation system;
- 2A DG fuel oil and lube oil subsystems while the 2B DG was unavailable during an overhaul; and
- 1B residual heat removal (RH) train in preparation for planned maintenance on the 1A RH train.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Quarterly Area Walkdowns

a. Inspection Scope

The inspectors conducted fire protection walkdowns which were focused on availability, accessibility, and the condition of fire fighting equipment; the control of transient combustibles and ignition sources; and on the condition and operating status of installed fire barriers. The inspectors selected fire areas for inspection based on their overall contribution to internal fire risk, as documented in the Individual Plant Examination of External Events with later additional insights or their potential to impact equipment which could initiate a plant transient. The inspectors used the documents listed in the Attachment to verify that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and that fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors verified that minor issues identified during the inspection were entered into the licensee's corrective action program.

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

- 2B DG and fuel oil tank rooms, zones 9.1-2 and 9.1-4;
- 346 foot elevation auxiliary building general area, zone 11.2-0;
- 2B DG during planned maintenance (including hot work), zone 9.1-2;
- Unit 1 auxiliary electrical equipment room, zone 5.5-1;
- Unit 2 auxiliary electrical equipment room, zone 5.5-2;
- 1B diesel-driven AF pump room, zone 11.4A-1;
- 2B diesel-driven AF pump room, zone 11.4A-2;
- Unit 1 lower cable spreading rooms, zones 3.2B-1, 3.2C-1, and 3.2D-1; and
- Unit 2 lower cable spreading rooms, zones 3.2B-2, 3.2C-2, and 3.2D-2.

b. Findings

No findings of significance were identified.

.2 Annual Fire Brigade Drill

a. Inspection Scope

The inspectors observed the licensee's response to a simulated fire on the 2A component cooling water pump located in the 346 foot elevation of the auxiliary building. The inspectors chose this scenario because the 2A component cooling pump is a safety-related mitigating component. Prior to the drill, the inspectors performed a walkdown of the simulation with the Fire Marshall to identify the specific hazards and drill objectives to be addressed by the fire brigade. Because there were no fire equipment cages in the auxiliary building, the inspectors also observed the licensee's controls for bringing in fire fighting equipment from the turbine building fire cages. During the drill, the inspectors observed the following specific aspects of the fire brigade response:

- the fire brigade responded in a timely manner;
- the protective equipment was in good working order and was properly donned by the fire brigade;
- fire hoses were properly laid out, charged, and tested prior to entering the fire area of concern;
- fire fighting equipment was properly staged and used; and
- the fire brigade leader had appropriate command and control and had good radio communication with the responders and the control room.

The inspectors also attended the post-drill critique to determine whether the pre-planned drill scenario was followed and whether the drill acceptance criteria was met. Documents reviewed during this inspection are listed in the Attachment. This review constituted one sample of this inspection requirement.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06)

Semi-Annual Inspection of Internal Flood Protection Barriers and Procedures

a. Inspection Scope

The inspectors conducted a semi-annual review of internal flooding vulnerabilities and protective measures for the following areas:

- Unit 1 engineered safety features switchgear rooms, and
- Unit 2 engineered safety features switchgear rooms.

This review constituted two samples of this inspection requirement.

These areas contained risk-significant equipment and were susceptible to flooding based on the licensee's risk analysis. The inspection included a review of the internal flooding design features described in the UFSAR and in the licensee's auxiliary building flood level calculations. The inspectors performed a walkdown of the selected areas to observe the condition of doors, floor drains, sump pumps, or other flood mitigating components credited in the licensee's calculation. The inspectors also determined whether assumptions used in the calculation, such as flooding sources or operator actions to identify/mitigate flooding, were reasonable. Documents reviewed as part of this inspection are listed in the Attachment. The inspectors verified that minor issues identified as part of this inspection were entered into the licensee's corrective action program.

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 an operating crew performance during an evaluated simulator out-of-the-box scenario. 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 as presented in the Exelon procedures listed in the Attachment.

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 verify that they also noted the issues and discussed them in the critique at the end of the session. This inspection constituted one sample.

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 risk-significant initiating event, mitigating, and barrier integrity systems. This evaluation consisted of the following specific activities:

- observing the conduct of planned and emergent maintenance activities where possible;
- reviewing selected CRs, open WOs, and control room log entries in order to identify system deficiencies;
- reviewing licensee system monitoring and trend reports;
- attending Plant Heath Committee, Management Review, and Nuclear Safety Review Board meetings where the status and plans for degraded systems were discussed;
- a partial walkdown of the selected system; and
- interviews with the appropriate system engineers.

The inspectors also reviewed whether the licensee properly implemented the Maintenance Rule, 10 CFR 50.65, for each system. 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 completed two samples in this inspection requirement by reviewing the following systems:

- AP system and
- process radiation monitoring system.

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 inspections were conducted to verify that evaluation, planning, control, and performance of the work were done in a manner to reduce the risk and minimize the duration where practical, and that contingency plans were in place where appropriate.

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

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

The inspectors completed five samples by reviewing the following activities:

- planned maintenance on the 2A DG coincident with the planned out-of-service of the 2SX016B and 2SX027B isolation valves for the 2B and D containment chillers;
- planned maintenance on the Unit 2 SATs and Unit 2 switchyard bus-tie breaker 14-15;
- emergent maintenance on the 2B DG during planned maintenance on the Unit 2 SATs;
- emergent troubleshooting and maintenance on the 114 instrument inverter following a trip of the inverter; and
- troubleshooting and testing following a 2A AF pump failure to start.

b. Findings

No findings of significance were identified.

1R14 Operator Performance During Non-Routine Evolutions and Events (71111.14)

a. Inspection Scope

The inspectors completed two samples by observing the following events:

- cross tying the Units 1 and 2 safety-related 4 kV buses during planned maintenance on the Unit 2 SATs and

- unplanned loss of instrument bus 114.

For these events, the inspectors observed control room activities, interviewed plant operators and other personnel, and reviewed plant records including control room logs, operator turnovers, and CRs. The inspectors verified that personnel errors did not contribute to the events, that the events were entered into the licensee's corrective action program if appropriate, and that the operators' response to the events were in accordance with the applicable plant procedures. Documents reviewed as part of this inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

.1 Operability of the 0A Hydrogen Recombiner

a. Inspection Scope

As a result of the semiannual review for trends discussed in Section 4OA2.2 of this report, the inspectors evaluated the operability of the 0A hydrogen recombiner after failures of the reaction chamber heater and annunciators. Documents reviewed as part of this inspection are listed in the Attachment. This evaluation constituted one sample of this inspection requirement.

b. Findings

Introduction: The inspectors identified a NCV of TS 3.6.8 having a very low safety significance (Green) for conditions where the 0A hydrogen recombiner reaction chamber heater may have tripped during operations and operator identification of the problem may have been delayed because the recombiner's annunciators were not functioning.

Description: On March 3, April 23, April 27, and May 3, 2004, the reaction chamber heater breaker tripped during running of the 0A hydrogen recombiner for surveillance and troubleshooting. For the last three of the four trips, neither the local nor main control room annunciators for the recombiner worked, so that operators were not always immediately aware of the problem. During troubleshooting following the second and third trips, the licensee discovered that the output of the reaction chamber temperature controller was erratic and sluggish, but did not replace it until May 7, 2004, after the fourth failure. The licensee determined that the problem with the temperature controller was the most probable cause for all four of the heater breaker trips.

In the CR written for the first failure on March 3, 2004, the Shift Manager evaluated the recombiner as being operable because it functioned correctly for the remainder of the surveillance after the heater breaker was reset. In addition, the CR stated that the operating procedure for the recombiner should be changed to gradually bring the reaction

chamber up to operating temperature, by manually adjusting the temperature controller, rather than letting the controller operate automatically up to its preset value. The inspectors identified several problems with the licensee's operability evaluation:

- The recombiner was determined to be operable after the first failure despite the fact that the cause of the failure was not known. The surveillance was evaluated as being completed successfully despite the fact that the heater breaker had tripped during heatup.

- The assessment that it was acceptable to rely on manual operation of the temperature controller was made before the operating procedure was revised to direct that type of operation. In addition, the operators had not been trained on manual operation, and the need to gradually bring up temperature was known only to some of the operators. The NRC generally does not allow credit for manual operation of equipment designed to operate automatically unless, among other requirements, procedures are in place and appropriate training has been completed. The operating procedure was not revised until May 3, 2004.

- On April 5, 2004, operators questioned the operability of the recombiner with this manual action and the Design Engineering Manager evaluated it as being operable based on a statement in the NRC Safety Evaluation Report (SER) that stated that the recombiner was started manually and locally operated and controlled. The licensee based its operability assessment primarily on one isolated statement in the SER without considering several statements in the UFSAR which clearly showed that the temperature controller was designed to heat up the gas automatically to the preset value rather than depend on manual operation:

    - UFSAR Section 6.2.5.2.1 stated that, once the recombiner was started by opening isolation valves and locally actuating the start switch, "The gas temperature is raised by the heaters until the hydrogen-oxygen reaction starts. As the gas temperature in the reaction chamber approaches the preset point of 1325°F [Fahrenheit], the gas heater automatically reduces its power demand to maintain that preset temperature."

    - Section 6.2.5.5 of the UFSAR further stated that the recombiner control panels "include adequate automatic controls and alarms to allow the unattended operation of the recombiners," and that "these controls include an automatic temperature controller for the regulation of the air temperature in the recombiner chamber," and

    - Section 7.3.1.1.16 of the UFSAR stated that "the recombiners are designed to operate automatically and unattended after manual startup."

    These statements clearly show that the temperature controller was designed to heat up the gas automatically to the preset value rather than depend on manual operation.

- In the operability evaluations, the licensee did not consider that monitoring of the recombiner was further degraded by the loss of the annunciators. The sentence following the statement about local control and operation of the recombiner in the SER, stated, "sufficient local alarms are provided to indicate if the hydrogen recombiners are not performing properly, and this information also is indicated in the main control room by a common trouble alarm." As discussed above, UFSAR Section 6.2.5.5 also stated that the recombiner control panels "include adequate automatic controls and alarms to allow the unattended operation of the recombiners." The operating procedure only required that the recombiner be checked once each shift after it had stabilized. With no annunciators, the recombiner could have been tripped for about 8 hours before being discovered. With the heaters tripped, the reaction chamber temperature would not have remained high enough for the hydrogen-oxygen recombination reaction to take place.

- The licensee did not consider the effect of the additional heat input from the hydrogen-oxygen reaction that would be taking place in a accident when it determined that the recombiner could be considered operable with the sluggish reaction chamber temperature controller. With that additional heat input, the sluggish controller would probably have a harder time limiting temperature rises and a heater breaker trip from high chamber temperature would be more likely.

- When the operating procedure was changed to direct manual operation of the temperature controller to gradually bring up reaction chamber temperature, the procedure writer did not consider the fact that the system would no longer be heated up automatically to the preset temperature of 1325°F as described in the UFSAR. This introduced new failure modes of the equipment due to misoperation. Section B.3.6.8 of the TS Basis for the recombiners stated, "the only credible failure involves loss of power, blockage of the internal flow, missile impact, etc." The design basis of the system apparently did not consider human error probability and that probability was not evaluated as part of the procedure change.

The inspectors determined that, although the recombiner might also be considered inoperable during periods when one or two of the conditions described above existed, the combination of all three of the conditions simultaneously (erratic temperature controller causing heater breaker trips, lack of procedures and training for manual operation of the temperature controller, and lack of annunciation to indicate heater breaker trips) clearly made the 0A hydrogen recombiner incapable of meeting its safety function because it was degraded to the point where it would not operate reliably as described in the UFSAR and SER. The time period when all three of the conditions existed simultaneously was from at least March 21, 2004, through May 3, 2004, a period of at least 43 days. This was longer than the 30 day allowed outage time in the TS.

Analysis: The inspectors determined that the finding associated with inoperability of the 0A hydrogen recombiner was due to a performance deficiency, caused by a combination of inadequate corrective actions and incorrect operability determinations, warranting a significance evaluation. The inspectors concluded that the finding was greater than minor

in accordance with IMC 0612, “Power Reactor Inspection Reports,” Appendix B, “Issue Disposition Screening,” issued on June 20, 2003. The inspectors answered “yes” to minor question Number 4 because the finding was associated with the containment barrier integrity cornerstone attribute of risk important systems function and affected the cornerstone objective of providing reasonable assurance that the physical containment barrier would protect the public from radio nuclide releases caused by accidents or events. The function of the recombiners was to remove hydrogen from the containment, post accident, before it threatened containment integrity by reaching highly flammable concentrations. The finding also affected the cross-cutting areas of Human Performance, because incorrect operability determinations were made, and Problem Identification and Resolution, because the cause of the heater breaker trips was not identified and corrected until the recombiner had been inoperable longer than its allowed outage time.

The inspectors completed a significance determination of this issue using IMC 0609, “Significance Determination Process (SDP),” dated March 18, 2002. Using the Phase 1 screening worksheet, the inspectors answered “yes” to question 3 in the Containment Barriers column because the finding caused an actual reduction of the atmospheric pressure control function of the reactor containment. After consulting with the regional Senior Reactor Analyst, the inspectors conducted a Phase 2 analysis using IMC 0609 Appendix H, “Containment Integrity Significance Determination Process.” The finding was screened as Green because it did not affect the core damage frequency and failure of a hydrogen recombiner did not have a significant effect on the large early release frequency for a pressurized water reactor with a large dry containment. Therefore, this finding was considered to be of very low safety significance (Green) and was assigned to the Barrier Integrity cornerstone of both units (since the 0A hydrogen recombiner could serve either unit).

Enforcement: Technical Specification 3.6.8 stated that two hydrogen recombiners shall be operable, in Modes 1 and 2. With one recombiner inoperable, the recombiner must be restored to operable status within 30 days or the unit must be placed in Mode 3 (hot standby) within 6 hours. Contrary to the above, between March 21, 2004, and May 3, 2004, the 0A hydrogen recombiner was inoperable due to a combination of an erratic automatic reaction chamber temperature controller causing heater breaker trips, a lack of a procedure or training for operating the temperature controller manually, and a lack of annunciation to alert the operators to a trip of the heater breaker. During that time period both units operated in Mode 1 in excess of 30 days and were not placed in Mode 3 within 6 hours of exceeding 30 days. The operating procedure was revised on May 3, 2004, and the erratic temperature controller was replaced and successfully tested on May 7, 2004. The annunciator problem was scheduled to be repaired in December 2004. The licensee entered the problems with the recombiner into its corrective action program as CRs 207859, 213227, 216732, 220805, and 229190. Because this violation was of very low safety significance and it was entered into the licensee’s corrective action program, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy. (NCV 05000456/2004004-02; 05000457/2004004-02)

.2 Other Operability Evaluations

a. Inspection Scope

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

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

- CR 210520 regarding storage of the Unit 1 curved wall hoist;
- CR 208767 regarding excessive air found during venting of ECCS piping;
- the effect on control room habitability analysis following the movement of several thousand gallons of sodium hypochloride into the plant protected area;
- the operability of the Units 1 and 2 miscellaneous electrical equipment room ventilation systems following several, room high temperature events; and
- CR 115863 regarding control room ventilation outside air damper being found installed backwards.

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds

.1 Review of Selected Operator Workarounds

a. Inspection Scope

The inspectors reviewed whether ongoing issues with the operation of the Unit 1 containment leak detection sump constituted an operator workaround. Specifically, due to blockage in the sump's weir slot, the sump required frequent flushing in order to maintain its operability. The blockage had resulted in frequent, false indications of increased containment leakage, resulting in nuisance alarms that potentially challenged the control room staff.

The inspectors reviewed the UFSAR, TS, and the documents listed in the Attachment, as well as interviews with operators, and determined that the issue was not an operator workaround. Although the sump was the primary method of detection, the operators had other indications of containment leakage which were operable and credited in the TS. The inspectors verified that minor issues identified during this inspection were entered into the licensee's corrective action program. This inspection was considered to be one sample of the operator workarounds inspection requirement.

b. Findings

No findings of significance were identified.

.2 Semiannual Review of Operator Workarounds

a. Inspection Scope

The inspectors completed a semi-annual review of the cumulative effects of operator workarounds. The inspectors verified that the workarounds did not have a significant effect on the reliability, availability, or the ability to correctly operate mitigating systems and that they would not significantly increase operator response time to transients and accidents. The inspectors also verified that the licensee had plans and schedules established to correct the conditions in a reasonable time. In addition to operator workarounds, the inspectors reviewed operability evaluations, operator challenges, and temporary modifications for cumulative effects. The inspectors reviewed the documents listed in the Attachment as part of this inspection. This review represented one inspection sample.

b. Findings

No findings of significance were identified.

1RST Post-Maintenance and Surveillance Testing - Pilot (71111.ST)

a. Inspection Scope

The inspectors reviewed post-maintenance and surveillance testing activities associated with important mitigating, barrier integrity, and support systems to ensure that the testing adequately verified system operability and functional capability. For post-maintenance testing, the inspectors used the appropriate sections of the TS and UFSAR, as well as the WOs for the work performed, to evaluate the scope of the maintenance and to verify that the post-maintenance testing was performed adequately, demonstrated that the maintenance was successful, and that operability was restored. For surveillance testing, the inspectors verified that the testing met the TS, the UFSAR, and licensee procedural requirements, and demonstrated that the equipment was capable of performing its intended safety functions. The inspectors verified that the testing met the frequency requirements; that the tests were conducted in accordance with the procedures, including establishing the proper plant conditions and prerequisites; that the test acceptance criteria was met; and that the results of the tests were properly reviewed and recorded. The activities were selected based on their importance in verifying 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.

Note that this inspection is a pilot for a proposed consolidated procedure combining the previous Post-Maintenance Testing (71111.19) and Surveillance Testing (71111.22) procedures.

Four samples were completed by observing post-maintenance testing after the following activities:

- planned maintenance on the 1A condensate/condensate booster pump;
- repair of a speed sensing circuit on the 2B DG;
- completion of a planned maintenance overhaul on the 2B DG; and
- troubleshooting and replacement of a start interlock relay on the 2A AF pump.

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

- 2B solid state protection system bimonthly testing;
- Unit 1 main steam safety relief valve lift testing;
- 2B DG monthly operability testing; and
- 2A AF pump quarterly testing (this test failed due to failure of the pump to start from the main control room).

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed a temporary modification involving installation of a jumper to simulate that the feedwater isolation test reset switch on panel 2PA11J was in the normal position. The inspectors verified the change did not have an unanalyzed affect on the safety functions of important safety systems. As part of this inspection, the inspectors reviewed the 10 CFR 50.59 screening, appropriate UFSAR sections, and the TS, to verify that system operability/availability was not affected. The inspectors verified that the installation was consistent with the design documents, that the installation was properly flagged, and that the appropriate post-installation testing was accomplished. Documents reviewed as part of this inspection are listed in the Attachment. This inspectors completed one sample of this inspection requirement.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

The inspectors observed operator performance during an evaluated simulator drill. The inspectors observed event classification, NRC notifications, and other aspects of drill performance, to identify weaknesses and ensured that the licensee evaluators had also noted the same weaknesses. The inspectors verified that deficiencies noted during the drill, by either the inspectors or licensee evaluators, were entered into the licensee's corrective action program. The inspectors also attended the post drill critique for the simulator crew. Documents reviewed as part of this inspection are listed in the Attachment. This activity constituted one inspection sample.

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 records to determine if any occupational exposure control cornerstone performance indicator (PI) event had been identified during the previous five calender quarters (none were identified). If PI events had been identified, the inspectors would have determined whether or not the conditions surrounding the events had been evaluated and whether or not identified problems had been entered into the corrective action program for resolution. This review represented one sample.

b. Findings

No findings of significance were identified.

2. Plant Walkdowns and Radiation Work Permit (RWP) Reviews

a. Inspection Scope

The inspectors walked down and surveyed (using an NRC survey meter) selected areas in the Unit 1 and Unit 2 auxiliary buildings 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. This represented one sample.

b. Findings

No findings of significance were identified.

2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03)

.1 Inspection Planning

a. Inspection Scope

The inspectors reviewed the UFSAR to identify applicable radiation monitors associated with transient high and very high radiation areas including those used in remote emergency assessment. This represented one sample.

The inspectors identified the types of portable radiation detection instrumentation used for job coverage of high radiation area work, other temporary area radiation monitors currently used in the plant, continuous air monitors associated with jobs with the potential for workers to receive 50 mrem committed effective dose equivalent (CEDE), whole body counters, and the types of radiation detection instruments utilized for personnel release from the radiologically controlled area. This represented one sample.

The inspectors verified calibration, operability, and alarm setpoint (if applicable) of the following instruments:

- IPM-8 Whole Body Frisking Monitor;
- Eberline Model 6112 Teletector;
- Eberline PM-7 Portal Monitors; and
- Bicron Model RSO-50E Ionization Chamber.

The inspectors determined what actions were taken when, during calibration or source checks, an instrument was found significantly out of calibration (greater than 50 percent) and determined possible consequences of instrument use since last successful calibration or source check. The inspectors also reviewed the licensee's 10 CFR Part 61 source term reviews to determine if the calibration sources used are representative of the plant source term and alarm setpoints of instruments used for personnel release reflected plant source term. This represented one sample.

b. Findings

No findings of significance were identified.

.2 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed a Check-In Self-Assessment Report on radiation monitoring instrumentation and protective equipment to verify that identified problems were entered into the corrective action program for resolution. Event reports involving internal exposures >50 mrem CEDE were reviewed to determine if the affected personnel were properly monitored utilizing calibrated equipment and if the data was analyzed and internal exposures properly assessed in accordance with licensee procedures. This represented one sample.

The inspectors reviewed CRs related to exposure significant radiological incidents that involved radiation monitoring instrument deficiencies since the last inspection in this area. 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. This represented one sample.

The inspectors determined if the licensee's self-assessment activities were identifying and addressing repetitive deficiencies or significant individual deficiencies in problem identification and resolution. This represented one sample.

b. Findings

No findings of significance were identified.

.3 Radiation Protection Technician Instrument Use

a. Inspection Scope

The inspectors verified the calibration expiration and source response check currency on radiation detection instruments staged for use and observed radiation protection technicians for appropriate instrument selection and self-verification of instrument operability prior to use. This represented one sample.

b. Findings

No findings of significance were identified.

.3 Self-Contained Breathing Apparatus (SCBA) Maintenance and User Training

a. Inspection Scope

The inspectors reviewed the status and surveillance records of SCBAs staged and ready for use in the plant and inspected the licensee's capability for refilling and transporting SCBA air bottles to and from the control room and operations support center during emergency conditions. The inspectors determined if control room operators and other emergency response and radiation protection personnel were trained and qualified in the

use of SCBAs (including personal bottle change-out). The inspectors verified that individuals on each control room shift crew, and individuals from designated department were currently assigned emergency duties (e.g., onsite search and rescue duties). This represented one sample.

The inspectors reviewed the qualification documentation for personnel designated to perform maintenance on the vendor-designated vital components, and the vital component maintenance records over the past 5 years for several SCBA units currently designated as "ready for service." The inspectors also ensured that the required, periodic air cylinder hydrostatic testing was documented and up to date, and that the Department of Transportation required retest air cylinder markings were in place for these units. The inspectors reviewed the onsite maintenance procedures governing vital component work including those for the low-pressure alarm and pressure-demand air regulator and licensee procedures, and the SCBA manufacturer's recommended practices to determine if there were inconsistencies between them. This represented one sample.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

Cornerstones: Mitigating Systems and Barrier Integrity

Reactor Safety Strategic Area

a. Inspection Scope

The inspectors reviewed the documents listed in the Attachment to verify that the licensee had corrected reported PI data, in accordance with the criteria in NEI [Nuclear Energy Institute] 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 2. The data reported by the licensee was compared to a sampling of control room logs, CRs, and other sources of data generated since the last verification. The inspectors verified that minor issues identified during the inspection were entered into the licensee's corrective action program. The inspectors completed four samples by verifying the following PIs:

Unit 1

- safety system unavailability - emergency AC [alternating current] power system for the period of April 1, 2003, through March 31, 2004; and

- reactor coolant system leakage for the period of April 1, 2003, through March 31, 2004.

Unit 2

- safety system unavailability - emergency AC power system for the period of April 1, 2003, through March 31, 2004; and
- reactor coolant system leakage for the period of April 1, 2003, through March 31, 2004.

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 discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Additionally, the inspectors reviewed all new CRs on a daily basis as part of the semiannual trending review. 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 finding of significance were identified.

.2 Semiannual Review for Trends

a. Scope

The inspectors reviewed all CRs (approximately 2500) generated during the time period of December 2003 through May 2004 in an attempt to identify potential trends. This inspection was part of the requirements of Inspection Procedure 71152 for monitoring plant status but was not considered an inspection procedure sample. Documents reviewed which indicated previously unrecognized trends are listed in the Attachment. The inspectors verified that minor issues identified during this inspection were entered into the licensee's corrective action program. The screening was accomplished as follows:

- CRs dealing with company policies, administrative issues, and other minor issues were eliminated as being outside the scope of this inspection;
- CRs dealing with instrument calibration trends were eliminated because that program was recently evaluated as part of the biennial Problem Identification and Resolution Inspection and found to be acceptable;
- the remaining CRs were sorted into broad categories as part of the daily screening;
- for the semiannual inspection, the CRs in the broad categories were further sorted into groups involving the same equipment, the same issue, or the same program;
- single CRs with no repeat occurrences or common issues were eliminated;
- the remaining groups were screened for potential common cause issues and considered potential trends;
- the inspectors eliminated groups of CRs that discussed NRC-identified trends from previous inspection activities;
- the inspectors eliminated groups of CRs that discussed strictly programmatic problems because the inspection requirement was primarily for equipment problems and human performance issues;
- the inspectors removed groups of CRs that discussed security issues, those may be reviewed and documented as necessary in a separate report during a future inspection by a security specialist;
- the inspectors eliminated groups of CRs where their review indicated that duplicate CRs had been written for the same event or failure;
- the inspectors eliminated groups of CRs where a sudden increase in the number of CRs generated was due to a special licensee initiative to specifically look for issues in a certain area;
- the inspectors obtained lists of all licensee common cause investigations initiated in the last year, all CRs in which the title indicated a trend or potential trend, and all systems in the maintenance rule (a)(1) status, these were considered licensee-identified trends, and CRs associated with those issues were removed for possible future reviews of the effectiveness of corrective actions for those trends;
- the remaining groups, considered potential unidentified trends, were provided to the licensee for discussion in case there was extenuating information that the inspectors were not aware of; and
- groups of CRs remaining after all of the above screening were considered trends which the licensee had failed to identify.

b. Finding and Observations

One finding of very low safety significance (Green) involving a NCV of NRC requirements was identified. However, that finding is documented in detail in Section 1R15.1 of this report.

The inspectors determined that licensee employees were writing CRs with a low threshold, that employees at all levels of the organization were writing CRs, and that CRs were written for all issues of significance. The largest group of CRs were written for employee-identified industrial safety issues, one indication of a safety conscious work environment.

The inspectors determined that the licensee had identified the majority of trends. The licensee had initiated about 40 common cause analysis actions for identified trends in the last year and had written about 40 other CRs to evaluate other trends or potential trends to determine if a common cause evaluation was necessary. The licensee-identified trends were identified by a combination of the work groups involved with the issues, department or station corrective action program coordinators, department managers, and the nuclear oversight group, indicating that multiple groups were looking for trends.

The inspectors identified the following trends that had not been previously identified and/or adequately assessed by the licensee:

- Repeated problems with reaction chamber heater breakers tripping and annunciators being inoperable on the 0A hydrogen recombiner (CRs 207859, 213227, and 216732). On March 3, April 23, April 27, and May 3, 2004, the reaction chamber heater breaker tripped during running of the 0A hydrogen recombiner. In addition, for the last three of the four trips, neither the local nor main control room annunciators for the recombiner worked, so that operators were not always immediately aware of a problem. On May 7, 2004, a problem was discovered with the temperature controller for the heater, and it was replaced and successfully tested. The inspectors determined that the problem with the temperature controller was the most probable cause for all four of the failures. The annunciator problem was scheduled to be repaired in December 2004. The licensee documented each failure in CRs but did not classify the problems as an adverse trend or initiate a common cause analysis. The inspectors determined that this issue was more than minor and that the hydrogen recombiner was inoperable for longer than the allowed outage time in the TSs. As a result of this inspection, the licensee initiated CR 229190 to further evaluate this issue. This issue, and the associated finding, was discussed in detail in Section 1R15.1 of this report.

- Repeated problems with the cranking time delay relay on the 0B diesel-driven fire pump (CRs 79011; 129245; and 188766). On October 15, 2001, October 28, 2002, and December 1, 2003, the 0B fire pump failed annual tests of the cranking system. In each case the problem was found to be with a time delay relay and the relay was replaced each time. Although the licensee referenced the earlier failures in each subsequent CR, it did not classify the issue as an adverse trend nor did it initiate a common cause analysis to evaluate why the same relay was failing repeatedly. This was considered a minor issue in that the pump was degraded but still available and the licensee demonstrated that the engine would have reliably started despite the cranking problems. As a result of this inspection, the licensee initiated CR 229448 to review the issue as a potential adverse trend.

- Blocked incore detector thimble tubes on both units (CRs 131365, 185036, 187512, 193763, 195016, and 213819). There have been numerous blocked incore detector thimbles discovered in the last two operating cycles on both units. Efforts to replace thimble tubes during refueling outages were not effective, in that, many of the replaced tubes quickly became reblocked in the next operating cycle.

The licensee had not initiated a common cause analysis for the repeated problems. This was considered a minor issue because the number of blocked tubes never reached the threshold where adequate core monitoring was not possible and no midcycle unit shutdowns were required. In addition, although the licensee had not identified the issue as an adverse trend, it had identified that earlier corrective actions had not been effective and had planned further corrective actions for the next refueling outages on both units. As a result of this inspection, the licensee initiated CR 229041 to review the issue as a potential adverse trend.

.3 Annual Sample

Open CRs Older Than 2 Years

Introduction

The inspectors selected CRs that had action assignments that remained open for greater than two years for review of the licensee's problem identification and resolution program. This sample was selected to verify that the licensee was giving adequate priority to timely completion of corrective actions. Documents reviewed as part of this inspection are listed in the Attachment. This activity constituted one sample of this inspection requirement.

a. Prioritization and Evaluation of Issues

(1) Inspection Scope

The inspectors considered the licensee's evaluation and disposition of performance issues, and application of risk insights for prioritization of issues.

(2) Issues

The inspectors determined that licensee corrective actions were based on a qualitative assessment of risk. For the issues reviewed, the inspectors did not find any discrepancies with the apparent risk and the categorization assigned by the licensee. Pending corrective actions did not impact the immediate operability of associated equipment.

b. Effectiveness of Corrective Actions

(1) Inspection Scope

The inspectors reviewed multiple CRs to determine if the CRs addressed generic implications and that corrective actions were appropriately focused to correct the problem.

(2) Issues

The inspectors determined that completed corrective actions identified in the CRs appeared to be adequate and were focused on the apparent cause of each condition. In many cases (for example CRs 3316 and 102884) the pending corrective actions addressed followup assessments (i.e., Effectiveness Reviews) to verify the adequacy of completed corrective actions.

4OA3 Event Followup (71153)

The inspectors completed two inspection samples in this area.

.1 Licensee Event Report Review

(Closed) LER 05000456/2004-001-00; 05000457/2004-001-00: Licensed Maximum Power Level Exceeded Due to Inaccuracies in Feedwater Ultrasonic Flow Measurements

This event was previously discussed in IR 05000456/2004003; 05000457/2004003, Section 4OA3.4, and was dispositioned as a licensee-identified NCV in that report. At the time of that report, the LER had not yet been issued. The inspectors reviewed the LER and did not identify any new concerns.

.2 Illinois Seismic Event

a. Inspection Scope

On June 28, 2004, the central Illinois area experienced an earthquake of 4.5 on the Richter Scale centered 10 miles northwest of Ottawa, Illinois which was about 35 miles northwest of the Braidwood facility. Plant personnel felt the event but no seismic annunciators or other unusual responses were observed. The inspectors responded to the site and performed the following activities:

- interviewed operations personnel regarding their actions;
- reviewed control room indications;
- reviewed log entries;
- walked down safety-related and other risk-significant areas of the plant; and
- reviewed licensee procedure requirements for response to a seismic event.

Documents reviewed as part of this inspection are listed in the Attachment.

b. Findings

No findings of significance were identified. No plant damage was observed by either plant personnel or the inspectors.

4OA4 Cross-Cutting Aspects of Findings

.1 The finding described in Section 1R01.1 of this report had, as one of its causes, a human performance deficiency, in that, operators failed to identify loose scaffold material in the Unit 2 transformer material exclusion area despite numerous documented opportunities where the area was walked down using a procedure that specifically called for looking for that type of material.

.2 The finding described in Section 1R01.1 of this report also had, as another one of its causes, a problem identification and resolution deficiency, in that, the licensee corrective actions following two LOOP events and an NCV due to loose material near the transformer yards were not adequate to prevent recurrence of unauthorized loose material being in the Unit 2 transformer year during several periods of high winds and tornado watches.

.3 The finding described in Section 1R15.1 of this report had, as one of its causes, human performance deficiencies, in that, the Shift Manager and Design Engineering Manager failed to consider all of the design features described in the UFSAR and SER when evaluating the operability of the 0A hydrogen recombiner. As a result, the recombiner was improperly determined to be operable when, in fact, it was not.

.4 The finding described in Section 1R15.1 of this report also had, as another one of its causes, a problem identification and resolution deficiency, in that, the licensee corrective actions following identification of problems with the temperature controller and the annunciators of the 0A hydrogen recombiner were not completed in a timely manner. As a result, the recombiner was inoperable for longer than the allowed outage time in the TS.

4OA5 Other

Offsite Power System Operational Readiness (Temporary Instruction (TI) 2515/156)

a. Inspection Scope

The inspectors performed an operational readiness review of the offsite power system (OPS) in response to TI 2515/156, “Offsite Power System Operational Readiness.” The inspectors reviewed licensee maintenance records, event reports, corrective action documents and procedures, and interviewed station engineering, maintenance, and operations staff. Specifically, the inspectors gathered and reviewed licensee data supporting the following NRC requirements:

- Appendix A to 10 CFR Part 50, General Design Criterion 17, “Electrical Power Systems,” to minimize the likelihood of losing offsite power on loss of the generating unit;
- Appendix B to 10 CFR Part 50, Criterion III, “Design Control,” to confirm the design interface between the nuclear power plant (NPP) and the regional transmission operator (RTO);
- Criterion XVI, “Corrective Actions,” to confirm the licensee’s assessment of the industry operating experience from the August 14, 2003 grid event;

- licensee TS for determining operability of the OPS;
- the licensee's assumptions used in the station blackout (SBO) analysis performed per 10 CFR 50.63, "Loss of All Alternating Current Power," to determine an acceptable coping time; and
- the licensee's requirements for assessing risk when performing work on the OPS or the emergency onsite power systems per 10 CFR 50.65(a)(4).

The inspectors also assessed the licensee's implementation of applicable operating experience as well as corrective action documents to ensure issues were being identified at an appropriate threshold, assessed for significance, and appropriately dispositioned. The inspectors verified that minor issues identified during this inspection were entered into the licensee's corrective action program. Documents reviewed for this TI are listed in the Attachment. This activity was outside of the baseline inspection program and was therefore not considered a sample. The TI is considered complete for Unit 1 and Unit 2.

b. Observations and Findings

No findings of significance were identified. No immediate operability issues were identified during the inspection. In accordance with the TI 2515/156 reporting requirements, the inspectors provided the required data in the work sheets provided with the TI to the headquarters staff for further analysis.

4OA6 Meetings

.1 Exit Meeting

The inspectors presented the inspection results to Mr. T. Joyce and other members of licensee management at the conclusion of the inspection on July 7, 2004. 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

An interim exit was conducted for:

- Radiation Protection inspection with Mr. M. Pacilio on May 14, 2004.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee
T. Joyce, Site Vice President
K. Polsen, Plant Manager
G. Dudek, Operations Director
C. Dunn, Site Engineering Director
R. Gilbert, Nuclear Oversight Manager
J. Moser, Radiation Protection Manager
E. Stefan, Acting Regulatory Assurance - NRC Coordinator
E. Wriggly, Maintenance Director

Nuclear Regulatory Commission
S. Burgess, Senior Reactor Analyst
A. Stone, Chief, Reactor Projects Branch 3

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000457/2004004-01	NCV	Failure to Secure or Remove Loose Scaffold Material in the Unit 2 Transformer Yard (Section 1R01.1)
05000456/2004004-02; 05000457/2004004-02	NCV	0A Hydrogen Recombiner Inoperable for Longer Than TS Allowed Outage Time (Section 1R15.1)

Closed

05000457/2004004-01	NCV	Failure to Secure or Remove Loose Scaffold Material in the Unit 2 Transformer Yard (Section 1R01.1)
05000456/2004004-02; 05000457/2004004-02	NCV	0A Hydrogen Recombiner Inoperable for Longer Than TS Allowed Outage Time (Section 1R15.1)
05000456/2004-001-00; 05000457/2004-001-00	LER	Licensed Maximum Power Level Exceeded Due to Inaccuracies in Feedwater Ultrasonic Flow Measurements (Section 4OA3)

Discussed

05000456/2000005-01	NCV	Failure to Follow Adverse Weather Requirements (Section 1R01.1)

05000457/1996-001-00	LER	Inadequate Control of Staged Roofing Materials Leads to a Loss of Offsite Power due to a Loss of Both Unit 2 Station Auxiliary Transformers (Section 1R01.1)
05000456/1998-003-00	LER	Loss of Offsite Power Event due to an Electrical Fault Caused by Material Dislodged by High Winds (Section 1R01.1)

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 of 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

NCV 5000456/2000005-01; Failure to Follow Adverse Weather Requirements

LER 05000457/1996-001-00; Inadequate Control of Staged Roofing Materials Leads to a Loss of Offsite Power due to a Loss of Both Unit 2 Station Auxiliary Transformers

LER 05000456/1998-003-00; Loss of Offsite Power Event due to an Electrical Fault Caused by Material Dislodged by High Winds

CR A2000-01970; NRC Debrief; April 20, 2000

CR A2000-01973; Poor Communications During Threatening Weather; April 20, 2000

CR A2000-02183; Outside Areas Housekeeping Concerns; May 10, 2000

CR 212443; Potential Adverse Trend in Scaffold Erection on Safety-Related Equipment; April 1, 2004 [NRC-Identified]

CR 213535; Foreign Material Exclusion Concerns Identified by NRC on Various Hydramotors; April 6, 2004 [NRC-Identified]

CR 217774; NRC Concerns Identified at Bi-Weekly Debrief; April 29, 2004 [NRC Identified]

CR 221296; Discrepancies Identified During High Temperature Preventive Maintenance; May 14, 2004

CR 224258; Scaffold Remaining From Unit 2 SAT Work; May 27, 2004 [NRC-Identified]

CR 224281; Incorrect Sign on Jersey Barriers Leading to Transformer Yards; May 27, 2004

CR 225948; Enhance MA-AA-716-026 to Include Transformer Areas; June 4, 2004 [NRC-Identified]

NOSPA-MA/MW-03-002; Summer Readiness Fleetwide Nuclear Oversight Assessment Rollup; June 12, 2003

Exelon Nuclear Procedure MA-AA-716-026; Station Housekeeping/Material Condition Program; Revision 1

Exelon Nuclear Procedure OP-AA-108-109; Seasonal Readiness; Revision 1

0BwOA ENV-1; Adverse Weather Conditions Unit 0; Revision 101

2BwOL 3.8.1; AC Sources - Operating; Revision 8

WO 990125122 01; 2TS-DG112B Diesel Generator [DG] 2B Jacket Water Circulation Pump and Heater Control; May 25, 2001

WO 99139571 01; 1TS-DG112B DG 1B Jacket Water Circulation Pump; July 19, 2001

WO 00575304 01; High Temperature Equipment Protection; May 14, 2004

WO 00583595 17; Main Steam Safety Valves Operability Test; April 21, 2004

Braidwood's Archival Operations Narrative Logs; April 19, 2004, through April 20, 2004

Braidwood's Archival Operations Narrative Logs; April 23, 2004, through May 27, 2004

1R04 Equipment Alignment

1BwEP ES-1.4; Transfer to Hot Leg Recirculation Unit 1 (Open RH [residual heat removal] to Hot Legs Isolation Valve - 1SI8840); Revision 100

BwOP AF-E2; Electrical Lineup - Unit 2 Operating; Revision 6

BwOP AF-M2; Operating Mechanical Lineup Unit 2; Revision 7

BwOP AP-E8; Electrical Lineup - Unit 2 Operating Lineup for the Non-Safety-Related 4160V Busses, 480V Switchgear Busses, and 480V MCC's [motor control centers]; Revision 5

BwOP DG-1; DG Alignment to Standby Condition; Revision 19

BwOP DO-E2; Electrical Lineup - Unit 2 Diesel Lube Oil; Revision 0

BwOP DO-M6; Operating Mechanical Lineup Unit 2 Auxiliary Feedwater [AF] Diesel Fuel Oil; Revision 2

BwOP DO-M8; Operating Mechanical Lineup Unit 2 DG Lube Oil; Revision 3

BwOP DO-M10; Operating Mechanical Lineup Unit 2 DG Fuel Oil Storage; Revision 1E1

BwOP DO-M12; Operating Mechanical Lineup Unit 2 DG 2A Fuel Oil; Revision 4

BwOP IA-M3; Operating Mechanical Lineup Unit 0 Auxiliary Building Operating; Revision 10

BwOP RH-E1; Electrical Lineup - Unit 1 Operating; Revision 6

BwOP RH-M2; Operating Mechanical Lineup Unit 1 1B Train; Revision 7

Drawing M-55 Sheet 8; Diagram of Instrument Air - Auxiliary Building Braidwood Station Unit 1 & 2; Revision G

Drawing M-122; Diagram of Auxiliary Feedwater - Braidwood Station Unit 2; Revision AY

CR 193268; Potential Degradation of Capacitance Coupled Voltage Transformers (Bus 2 Phase Voltage Issue); January 3, 2004

CR 211622; Gap Between Ceiling Tiles in Division 21 Engineered Safety Features Switchgear Room; March 29, 2004; [NRC-Identified]

CR 212172; Question on Scaffold Clearances; March 31, 2004; [NRC-Identified]

CR 212179; 2AP18EJ Breaker Found Racked Out and Open Should be Racked In and Closed; March 31, 2004; [NRC-Identified]

CR 212195; NRC Inspector Questions Regarding Motor Control Center Labeling; March 30, 2004; [NRC-Identified]

CR 212375; AF Focused Area Self-Assessment Report Identified Deficiency; May 22, 2003

CR 214123; NRC Concern - DG Jacket Water Heater Reset Value Differences; April 8, 2004; [NRC-Identified]

CR 220610; 2AF004B Instrument Air Accumulator Upstream Isolation Not Tagged Nor Listed in the Mechanical Lineup; May 12, 2004; [NRC-Identified]

CR 222004; Revise Piping and Instrumentation Drawings M-50-4 and M-130-2; May 18, 2004 [NRC-Identified]

1R05 Fire Protection

CR 216615; Enhancements Identified During 2nd Quarter Fire Drill; April 23, 2004

CR 225721; NRC Resident Inspector Questions from Lower Cable Spreading Room Walkdown; June 2, 2004; [NRC Identified]

CR 226014; NRC/IEMA [Illinois Emergency Management Agency] Question Regarding Control of Transient Combustible; June 4, 2004; [NRC-Identified]

Fire Drill Scenario No. 20.04.23.04; 2CC01PA Motor Fire; April 19, 2004

Fire Protection Report Section 2.2; Area Designations; Revision 20

Fire Protection Report Section 2.3; Fire Area Analysis; Revision 20

Fire Protection Report Appendix 5.4; Fire Protection System Description; Revision 20

Engineering Change 33714 9; Install Temporary Monitoring Equipment in the 1B AF Pump Room, Revision 0

Engineering Change 337151; Install Temporary Monitoring Equipment in the 2B AF Pump Room; Revision 0

1R06 Flood Protection Measures

BwAR 0-38-B7; Fire Pump 0A Running; Revision 6

BwAR 0-38-B8; Fire Pump 0B Running; Revision 7

BwAR 0-38-D9; Fire Pump Discharge Pressure Low 2; Revision 6

0BwOA PRI-8; Auxiliary Building Flooding Unit 0; Revision 2

Calculation 3C8-0685-002; Auxiliary Building Flood Level Calculations; Revision 13

CR 215092; Auxiliary Building Flood Level Calculation Inaccuracy; April 12, 2004; [NRC-Identified]

1R11 Licensed Operator Requalification Program

Licensed Operator Requalification Simulator Scenario Guide #0433; Secondary Transients Leading to Reactor Trip; Revision 0

Exelon Nuclear Procedure OP-AA-101-111; Roles and Responsibilities of On-Shift Personnel; Revision 1

Exelon Nuclear Procedure OP-AA-103-102; Watchstanding Practices; Revision 2

Exelon Nuclear Procedure OP-AA-103-103; Operation of Plant Equipment; Revision 0

Exelon Nuclear Procedure OP-AA-104-101; Communications; Revision 1

Exelon Nuclear Procedure OP-AA-300; Reactivity Management; Revision 0

1R12 Maintenance Effectiveness

BwAR 1-1PR06J; Gross Fail Fuel; Revision 2

1BwOA PRI-4; High Reactor Coolant Activity Unit 1; Revision 54A

Engineering Change 344175; Evaluate the Performance of Cubicle Cooler 1VA06SB for a Temporary Condition Where Only One Fan is Operational and the Essential Service Water Temperature is at or Below 98°F, and With no Tubes Plugged; Revision 1

(a)(1) Disposition Checklist and Action Plan Documentation; 480 Volt Alternating Current Engineered Safety Feature Motor Control Center Loads; April 12, 2004

Maintenance Rule - Performance Criteria; System: AP [auxiliary power]

Maintenance Rule - Evaluation History; System; AP; January 1, 2003 through April 5, 2004

Operational Execution Management Review Meeting Agenda; April 26, 2004

Plant Health Committee Meeting Agenda; May 3, 2004

Equipment Reliability Management Review Meeting Agenda; May 19, 2004

Nuclear Safety Review Board Meeting Agenda; June 23, 2004

CR 145803; 1VA06CC 1B Chemical and Volume Control Pump Cubicle Cooler Fan Blew Fuse Unplanned Limiting Condition for Operation; February 22, 2003

CR 154714; Coil Found Burnt in 1VA06CD Breaker; April 19, 2003

CR 180924; 2A Chemical and Volume Control Pump Cubicle Cooler Fan Tripped Causing Yellow Status; October 14, 2003

CR 182787; 1B Chemical and Volume Control Pump Cubicle Cooler Fan Failure; October 24, 2003

CR 190118; Repeat Maintenance - 2PR11J Radiation Monitor Failed After Filter Change; December 11, 2003

CR 191087; AP System Experiences Repetitive Maintenance Rule Functional Failures; December 16, 2003

CR 192456; 2PR27J Lost Sample Flow - Entered 2BwOS PR-1A; December 23, 2003

CR 193180; 0PR32J Monitor Sample Pump Tripped (Unplanned LCO [Limiting Condition for Operations] Entry); January 2, 2004

CR 202628; Repeat Maintenance - 1PR27J Wouldn’t Start After Maintenance; February 19, 2004

CR 202857; 1PR081 Valve Found Out of Expected Position (Open vs Closed); February 19, 2004

CR 203257; 0PR33J Iodine channel Failed Auto check Source; February 21, 2004

CR 203622; 2PR28J Particulate Channel Reading Lower Than Expected; February 24, 2004

CR 204444; Repeat Maintenance - 1B Chemical and Volume Control Cubicle Cooler Breaker Blowing Fuses; February 26, 2004

CR 204492; Assumptions in 1B Chemical and Volume Control Pump Cubicle Cooler Evaluation With One Fan; February 27, 2004

CR 206411; Unplanned Radiological Effluent TS Entry for 1PR02J Loss of Sample Flow; March 5, 2004

CR 207871; Potentially Missed Samples for 1PR02J Due to Sample Point Isolation; March 12, 2004

CR 212303; Unplanned Radiological Effluent TS Entry: 1PR01J Loss of Communication on 1PR30J; April 1, 2004

CR 212701; Loss of Sample Flow to 1PR06J; April 2, 2004

CR 212803; No (a)(1) Corrective Action Plan in Place for the AP System; April 2, 2004

CR 214582; B3 Trend Code: High Voltage Power Supply for 1PR09J Failed; April 12, 2004

CR 216486; Unplanned RETS Entry Due to 2PR001J Failure (Particulate); April 22, 2004

CR 220893; 1PR30J Check Source Failure Causes Unplanned Technical Requirements Manual Entry; May 13, 2004

CR 221108; Increasing Trend in 1RE-PR006B Alerts; May 14, 2004

CR 224823; Loss of Sample Flow to 2PR08J; May 31, 2004

CR 226942; Unplanned Administrative Action Requirement Entry Due to Loss of Sample Flow for 2PR08J; June 9, 2004

1R13 Maintenance Risk Assessments and Emergent Work Control

Exelon Nuclear Procedure WC-AA-101; On-line Work Control Process; Revision 9

2BwOL 3.7.5; LCOAR [limiting condition for operation action requirement] AF System Technical Specification LCO 3.7.5, Revision 3

BwOP AP-21; Isolating System Auxiliary Transformer 242-1 With Unit 2 UAT [Unit Auxiliary Transformer] Energized; Revision 14

Complex Troubleshooting Plan for 2A AF Pump; June 4, 2004

Monitoring Plan for 2A AF Pump Switchgear Breaker; June 5, 2004

Drawing 20E-2-4030AF01; Schematic Diagram AF Pump 2A; Revision W

Braidwood PRA [probabalistic risk assessment] Summary Report; Revision 5B

CR 216865; 2B DG Starting System Malfunction; April 25, 2004

CR 217078; 2B DG Work Package Instructions Inaccurate, Causing Delays; April 26, 2004

CR 217485; Posting of Protected Equipment for Unplanned Limiting Condition for Operation Entry 2B DG; April 28, 2004; [NRC Identified]

CR 225998; Unplanned LCO Entry for 2AF01PA; June 4, 2004

WO 70472-01; Troubleshoot/Repair Breaker Failed to Close; June 4, 2004
Daily Orders; Unit 0, 1, 2 for Period April 29 to April 30, 2004; April 29, 2004

Work Request 99069938 01; 114 Inverter Contingency Troubleshoot/Repair

Unit 2 Risk Assessment; Work Week 5/31/2004; Revision 2

1R14 Operator Performance During Non-Routine Evolutions and Events

1BwOA ELECT-2; Loss of an Instrument Bus; Revision 100

BwOP AP-26; Restoring System Auxiliary Transformer 242-2 With Unit 2 UAT Energized; Revision 11

BwOP IP-2; Transferring an Instrument Bus from the Inverter to the Constant Voltage Transformer; Revision 11

CR 222148; Unplanned LCO Entry due to Loss of Instrument Inverter 114; May 19, 2004

1R15 Operability Evaluations

Engineering Table; 0A Recombiner Detailed Timeline; June 17, 2004

UFSAR Section 6.2.5.2.1; Hydrogen Recombiner System Design; Revision 9

UFSAR Section 6.2.5.5; Instrumentation Requirements; Revision 9

UFSAR Section 7.3.1.1.16; Combustible Gas Control in Containment; Revision 9

Byron NRC Safety Evaluation Report NUREG 0876 Section 6.2.5; Combustible Gas Control System; Supplement 1

BwOP OG-10; Startup of a Hydrogen Recombiner; Revision 13

0BwOSR 3.6.8.1-1; Unit Common 0A Hydrogen Recombiner Refueling Interval Surveillance; Revision 2

2BwOSR 3.5.2.2-2; ECCS [emergency core cooling system] Venting and Valve Alignment Surveillance; Revision 8

Licensee memorandum; 0A Hydrogen Recombiner Operability Discussion; June 29, 2004

CR 115863; Damper 0VC312Y Found Installed Backwards; July 16, 2002

CR 199461; Potential Adverse Trend in Chemical Control Program Issues; February 4, 2004

CR 207859; 0A Hydrogen Recombiner Heater Tripped During Run; March 12, 2004

CR 208767; 2SI059A Was Vented for Four Minutes Prior to Being Water Solid; March 16, 2004

CR 210520; Hoist In Curved Wall Area Not Left in Proper Storage Area; March 27, 2004; [NRC-Identified]

CR 213227; Apparent Functional Failure of 0A Hydrogen Recombiner; April 5, 2004

CR 213889; NRC Concern With Unit 2 Air/Gas Intrusion; April 7, 2004; [NRC-Identified]

CR 216732; 0A Hydrogen Recombiner Heater Breaker Found Tripped; April 23, 2004

CR 220805; 0A Hydrogen Recombiner Annunciator Panel is not Working; May 13, 2004

CR 225742; Chemical Control Procedure EN-MW-501 Issue Raised; June 3, 2004; [NRC Identified]

CR 229190; Enhancement Opportunities Identified During 0A Recombiner Reviews; June 17, 2004

CR 230920; Discrepancy Noted With Hydrogen Recombiner Operation Versus UFSAR; June 23, 2004; [NRC-Identified]

WO 00688582 03; Troubleshoot/Repair/Replace 90 Amp Breaker at 0OG04J; Completed May 12, 2004

Braidwood's Archival Operations Narrative Logs; June 1, 2001 through June 8, 2004

Exelon Nuclear Procedure EN-AA-51; Chemical Management Program; Revision 0

Exelon Nuclear Procedure EN-MW-501; Chemical Management Program; Revision 3

Exelon Nuclear Procedure EN-MW-501-0002; Chemical Control Evaluation Guidance; Revision 1

Exelon Nuclear Issue Statement of Confirmation 00227241; NRC Question Regarding Miscellaneous Electric Equipment Room Temperature Design; June 7, 2004; [NRC Identified]

MAD Form 13.1; On-Site Hazardous Chemicals Effect on Control Room Habitability; June 6, 1975

Regulatory Guide 1.78; Assumptions for Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release; June 1974

NRC Letter From Varga to Farrar; Removal of Control Room Chlorine Monitors; March 4, 1987

1R16 Operator Workarounds

CR 215421; Unplanned Limiting Condition for Operation Entry Due to 1RF008 Alarm; April 16, 2004

CR 216547; 1RF008 Requires Frequent Flushing; April 23, 2004

CR 215549; Unit 1 RF Sump Instrumentation Condition; [NRC Identified]

Braidwood Open Operator Work-Around List Number 229

Braidwood Open Operator Challenge List Number 191

Open Control Room Corrective Work Orders; March 14 2004

1RST Post-Maintenance and Surveillance Testing - Pilot

BwOP AF-6; Motor Driven AF Pump A Shutdown; Revision 13

BwOP AF-5; Motor Driven AF Pump A Startup on Recirculation; Revision 18

BwOP DG-11; DG Startup; Revision 26

BwOP DG-12; DG Shutdown; Revision 20

2BwOSR 3.7.5.4-1; Unit Two Motor Driven AF Pump Surveillance; Revision 9

2BwOSR 3.8.1.2-2; Unit Two 2B DG Operability Surveillance; Revision 11

CR 214767; Unexpected Jumper Installed on 2CD05PD-JA (2PS-CD113); April 13, 2004

CR 215607; Oil in 2D Condensate/Condensate Booster Pump Condensate Side Discolored; April 19, 2004

CR 216865; 2B DG Starting System Malfunction - Unplanned Limiting Condition for Operations; April 25, 2004

CR 216999; Several New Agastat Relays do not Pass Acceptance Criteria; April 26, 2004

CR 217067; Relay Testing Procedure Issue (MA-BR-724-425); April 26, 2004

CR 217068; Relays From Store Room Failed to Function Properly; April 26, 2004

CR 217078; 2B DG Work Package Instructions Inaccurate, Causing Delays; April 26, 2004

CR 217485; Posting of Protected Equipment for Unplanned Limiting Condition for Operations Entry - 2B DG; April 28, 2004; [NRC-Identified]

CR 218472; Failure of Agastat Relays Tested for the 2B DG Window; May 5, 2004

CR 227302; 2A AF Pump Failed to Start from Main Control Room; June 9, 2004

Exelon Nuclear Procedure MA-AA-716-230-1002; Vibration Analysis/Acceptance Guideline; Revision 0

WO 672282; Unit 2 Solid State Protection System, Reactor Trip Breaker, Reactor Trip Bypass Breaker Bi-Monthly; May 3, 2004

Fragnet; 2B DG Work Window; Revision 16

1R23 Temporary Plant Modifications

Engineering Change 348694; Configure 2PA11J to Simulate Switch S816 in the Normal Position; April 29, 2004

1EP6 Drill Evaluation

Braidwood Station 2nd Quarter Emergency Preparedness Performance Indicator Drill Package; April 21, 2004

CR 222031 Emergency Preparedness Organization Improvement Items from 2nd Quarter Drill; May 18, 2004

CR 222037; Emergency Preparedness Enhancements for Exercise Management From 2nd Quarter Drill; May 18, 2004

2OS3 Radiation Monitoring Instrumentation and Protective Equipment

Check-In Self-Assessment Report Radiation Protection Braidwood Station; Radiation Monitoring Equipment and Protective Equipment; March 15, 2004

April 2004 SCBA Monthly Checks

BwRP 5510-13T4; ISI Viking Self-Contained Breathing Apparatus Checklist; Revision 0

BwRP 5510-13; Operation, Use, and Inspection of Self-Contained Breathing Apparatus (SCBA); Revision 9

BwRP 5822-20; Operation and Calibration of the IPM-8D/M and IPM-9D Whole Body Frisking Monitor; Revision 2

BwRP 5823-6; Operation and Calibration of the Eberline Model 6112 Teletector; Revision 4

BwRP 5823-6; Operation and Calibration of the Bicron Model RSO-50E Ionization Chamber; Revision 8

RP-BR-727; Operation and Calibration of the Eberline PM-7 Portal Monitors; Revision 0

RP-BR-802; Operation and Use of the Shepherd Model 89 Shielded Calibrator; Revision 0

CR 166187; Missed Source Check on Small Articles Monitor; July 3, 2003

CR 1755841; PowerLabs Incorrectly Calibrated 6112Bs (Rad Instruments); September 15, 2003

CR 178168; RP Instruments Returned from PowerLabs Failed Source Checks; September 23 2003

CR 208441; RP Instrument Check-In Assessment Recommendations; March 12, 2004

CR 208459; Check-In Assessment RP Instrument Deficiencies; March 12, 2004

CR 212583; Failed Source Checks on Radiation Protection Instrumentation; March 29, 2004

CR 217237; Non-Functional Calibrated Equipment from PowerLabs; March 10, 2004

4OA1 Performance Indicator Verification

CR 194054; Eagle Timer TSRA Fails During Surveillance; January 8, 2004

CR 194721; TSRA Failure Implementation Lessons Learned; January 8, 2004

CR 217774; NRC Concerns Identified at Bi-Weekly Debrief; April 29, 2004; [NRC-Identified]

CR 225729; NRC Resident Inspector Request for Selected DG NEI Numbers; June 3, 2004

CR 227522; NEI Reporting of Emergency AC Power Systems for June of 2003; June 10, 2004; [NRC-Identified]

Braidwood's Archival Operations Narrative Logs - Unit 1; April 1, 2003, through March 31, 2004

Braidwood's Archival Operations Narrative Logs - Unit 2; April 1, 2003, through March 31, 2004

Exelon Nuclear Procedure LS-AA-2040; Monthly Data Elements for NRC Safety System Unavailability - Emergency AC Power; Revision 4

Exelon Nuclear Procedure LS-AA-2100; Monthly Data Elements for NRC Reactor Coolant System Leakage; Revision 5

Exelon Nuclear Procedure WC-AA-111; Predefine Process; Revision 1

Predefine History; Unit 2 Reactor Coolant System Water Inventory Balance Surveillance (72 Hours); March 2003 through June 2003

WO 00570927; Reactor Coolant System Water Inventory Balance Surveillance (72 Hours); Performed April 30 - May 1, 2003

4OA2 Identification and Resolution of Problems

Semiannual Review For Trends

Licensee Report; Common Cause Analysis Assignments - 6/1/2003 thru 6/7/2004; June 7, 2004

Results of CR Title Word Search; Search Criteria: “Trend” Date Range: 1/1/2003 - 5/31/2004; June 3, 2004

CR 79011; 0B Diesel-Driven Fire Pump Fails Annual NFPA [National Fire Protection Association] Surveillance; October 16, 2001

CR 129245; 0B Fire Pump NFPA Annual Test Cranking Circuit Failure; October 28, 2002

CR 131365; Potential Repeat Maintenance - Unit 2 Flux Map Unexpected Responses; November 13, 2002

CR 185036; Incore Thimble Tube Restrictions Found During Eddy Current; November 6, 2003

CR 187512; Eight Movable Incore Detector Thimbles are Blocked/Not Usable; November 20, 2003

CR 188766; Failure During 0BwOS FP 3.3.E-12 (0B Fire Pump Test); December 2, 2003

CR 207859; 0A Hydrogen Recombiner Heater Tripped During Run; March 12, 2004

CR 220805; 0A Hydrogen Recombiner Annunciator Panel is no Working; May 13, 2004

CR 213227; Apparent Functional Failure of 0A Hydrogen Recombiner; April 5, 2004

CR 213819; Incore Detector F Stuck Below Reactor Vessel During Flux Mapping; April 7, 2004

CR 216732; 0A Hydrogen Recombiner Heater Breaker Found Tripped; April 23, 2004

CR 227445; NRC Question on Potential Trends at the Station; June 10, 2004; [NRC-Identified]

CR 229041; Potential Adverse Trend on Blocked Incore Thimbles; June 16, 2004; [NRC-Identified]

CR 229190; Enhancement Opportunities Identified During 0A Recombiner Reviews; June 17, 2004

CR 229448; Potential Adverse Trend for the 0B Fire Pump Cranking Cycle; June 17, 2004; [NRC-Identified]

Annual Sample

CR 3316; Spare Panel Breakers Left Energized; June 26, 1998

CR 80451; 0SX01CF-30" Pipe Wall Thinning Identified by Ultrasonic Testing Examination; October 26, 2001

CR 102884; Pressurizer Safety Valves Set Test Out of Tolerance; April 8, 2002

4OA3 Event Followup

LER 05000456/2004-001-00; 05000457/2004-001-00; Licensed Maximum Power Level Exceeded Due to Inaccuracies in Feedwater Ultrasonic Flow Measurements

Braidwood's Archival Operations Narrative Logs; June 28, 2004

0BwOA ENV-4; Earthquake Unit 0; Revision 101

1BwOA ENV-4; Earthquake Unit 1; Revision 54

CR 231931; Confirmed Seismic Event Requires Entry Into 0/1/2BwOA ENV-4; June 28, 2004

4OA5 TI 2515/156, Offsite Power System Operational Readiness

Braidwood Response to Significant Operational Event Report 99-1; Loss of Grid; June 1, 2000

BwAR 0-35-F5; System Frequency Low; Revision 4

BwAR 1-20-A1; Loss of Offsite Power; Revision 8

1BwOA ELEC-4; Loss of Offsite Power Unit 1; Revision 100

CR 171687; Grid Frequency Perturbation Results in Plant Transient; August 14, 2003

CR 175196; Institute for Nuclear Power Operations Significant Event Notification 242, Grid Instability/Trans Line Failures; September 10, 2003

CR 210832; Summer Readiness - Loss of Grid Lessons - Operational Experience; March 25, 2004

CR 212781; Switchyard Voltage at Midwest Region Operating Group Plants; April 2, 2004

CR 215229; Results of Review of Historical Switchyard Voltages; April 15, 2004

CR 215282; Switchyard Voltage at Midwest Region Operating group Plants; April 16, 2004

CR 219561; Discrepancy Between SPOG 1-1 and UFSAR Operating Voltage; [NRC-Identified]

CR 222710; The Expected Operating Switchyard Voltage in the UFSAR; May 21, 2004; [NRC-Identified]

Equipment Issue 221289; Switchyard Voltage Indicated Above the Limit of 362 kV on Main Control Board; May 14, 2004

NRC Information Notice (IN) 95-37; Inadequate Offsite Power System Voltages During Design-Basis Events; September 7, 1995

IN 98-07; Offsite Power Reliability Challenges from Industry Deregulation; February 27, 1998

IN 2000-06; Offsite Power Voltage Inadequacies; March 27, 2000

NRC Letter from Sands to Kovach; Safety Evaluations of the Byron Station and Braidwood Station Responses to the Station Blackout [SBO] Rule; August 6, 1990

Commonwealth Edison Letter from Taylor to Document Control Desk; Byron Station, Units 1 and 2 and Braidwood Station Units 1 and 2; Supplemental Response to SBO Rule NRC Docket Nos. 50-454/455 and 50-456/457; November 2, 1990

NRC Letter from Pulsifer to Kovach; Supplemental Safety Evaluation of Byron Station, Units 1 and 2 and Braidwood Station Units 1 and 2; Response to the SBO Rule; March 14, 1991

NRC Letter from Pulsifer to Kovach; Correction to Supplemental Safety Evaluation of Byron Station, Units 1 and 2 and Braidwood Station Units 1 and 2; Response to the SBO Rule; April 4, 1991

Exelon Nuclear Procedure OP-AA-101-113-1004; Guidelines for the Morning Plant Status Reports; Revision 3

Exelon Nuclear Procedure OP-AA-102-101; Unit Load Changes; Revision 2

Exelon Nuclear Procedure OP-AA-106-101; Significant Event Reporting; Revision 3

Exelon Nuclear Procedure OP-AA-108-107; Switchyard Control; Revision 1

Exelon Nuclear Procedure OP-MW-108-107-1001; Station Response to Grid Capacity Conditions; Revision 0

System Planning Operating Guide (SPOG) 1-1; Generating Stations Operating Voltage Level; Revision 6

SPOG 2-1; Expected Transmission Voltage Levels at Generating Stations; Effective Date May 15, 2003, Effective Until June 1, 2004

Temporary Operating Order TOO-041204-1-TDa; Voltage Limits for Nuclear Generating Stations April 23, 2004 Re-Issue as Revision 1

Transmission Control Procedure 1 - 1.0; Transmission Offsite Power System Maintain System Voltage Levels; Revision 3

Transmittal of Design Information DIT-BRW-2003-0022-01; Switchyard Voltage Design Requirements for Braidwood Units 1 and 2; April 16, 2003

Transmittal of Design Information DIT-BRW-2003-0022-01; Switchyard Voltage Design Requirements for Braidwood Units 1 and 2; April 9, 2004

Exelon Nuclear Procedure WC-AA-101; On-Line Work Control Process; Revision 9

Exelon Nuclear Procedure WC-MW-8002; Interface Agreement Between Comed Transmission and Substations Maintenance and Construction and Exelon Nuclear Generation; Revision 0

Exelon Nuclear Procedure WC-MW-8003; Interface Agreement Between Comed Transmission and Substations Maintenance and Exelon Nuclear Generation for Midwest Region Operating Group and Engineering Activities; Revision 1

LIST OF ACRONYMS USED

AC	Alternating Current
ADAMS	Agencywide Documents Access and Management System
AF	Auxiliary Feedwater
AP	Auxiliary Power
BwAR	Braidwood Annunciator Response Procedure
BwEP	Braidwood Emergency Procedure
BwOA	Braidwood Abnormal Operations Procedure
BwOL	Braidwood Operating Limiting Condition for Operations Procedure
BwOP	Braidwood Operating Procedure
BwOS	Braidwood Operations Surveillance
BwOSR	Braidwood Operating Surveillance Requirement Procedure
BwRP	Braidwood Radiation Protection Procedure
CEDE	Committed Effective Dose Equivalent
CFR	Code of Federal Regulations
CR	Condition Report
DG	Diesel Generator
ECCS	Emergency Core Cooling System
EED	Exelon Energy Delivery Systems
F	Fahrenheit
IEMA	Illinois Emergency Management Agency
IMC	Inspection Manual Chapter
IN	Information Notice

IR	Inspection Report
kV	Kilovolts
LCO	Limiting Condition for Operations
LCOAR	Limiting Condition for Operations Action Requirement
LER	Licensee Event Report
LOCA	Loss of Coolant Accident
LOOP	Loss of Offsite Power
MCC	Motor Control Center
NCV	Non-Cited Violation
NDO	Exelon Nuclear Duty Officer
NEI	Nuclear Energy Institute
NFPA	National Fire Protection Association
NPP	Nuclear Power Plant
NRC	Nuclear Regulatory Commission
OPS	Offsite Power System
PARS	Publicly Available Records
PI	Performance Indicator
PRA	Probabilistic Risk Assessment
RH	Residual Heat Removal
RTO	Regional Transmission Operator
RWP	Radiation Work Permit
SAT	Station Auxiliary Transformers
SBO	Station Blackout
SCBA	Self-Contained Breathing Apparatus
SDP	Significance Determination Process
SER	Safety Evaluation Report
SPOG	System Planning Operating Guide
TI	Temporary Instruction
TS	Technical Specification
UAT	Unit Auxiliary Transformer
UFSAR	Updated Final Safety Analysis Report
V	Volts
WO	Work Order