

October 28, 2003

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

SUBJECT: BRAIDWOOD STATION, UNITS 1 AND 2
NRC INTEGRATED INSPECTION REPORT 05000456/2003006;
05000457/2003006

Dear Mr. Skolds:

On September 30, 2003, 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 October 6, 2003, 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, the NRC has determined that a Severity Level IV violation of NRC requirements occurred. This violation is being treated as a Non-Cited Violation (NCV), consistent with Section VI.A of the Enforcement Policy. The NCV is described in the subject inspection report. Additionally, a licensee-identified violation is listed in Section 4OA7 of this report.

If you contest the violation or severity level of these NCVs, 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, 801 Warrenville Road, Lisle, IL 60532-4351; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector at the Braidwood facility.

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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 05000456/2003006; 05000457/2003006
w/Attachment: Supplemental Information

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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: 05000456/2003006; 05000457/2003006

Licensee: Exelon Generation Company, LLC

Facility: Braidwood Station, Units 1 and 2

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

Dates: July 1 through September 30, 2003

Inspectors: S. Ray, Senior Resident Inspector
N. Shah, Resident Inspector
D. McNeil, Reactor Inspector (Lead Operations Examiner)
D. Nelson, Radiation Specialist
B. Palagi, Senior Operations Examiner
D. Schrum, Reactor Inspector
D. Smith, Senior Resident Inspector, Dresden
P. Smith, Illinois Emergency Management Agency
T. Tongue, Project Engineer
P. Young, Operations Examiner

Observers: L. Haeg, Intern

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

Enclosure

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SUMMARY OF FINDINGS

IR 05000456/2003006, 05000457/2003006; 07/01/03 - 09/30/03; Braidwood Station, Units 1 & 2; Performance Indicator Verification.

This report covers a 3-month period of baseline resident inspection and announced baseline inspections on radiation protection, operator licensing, and maintenance effectiveness. The inspection was conducted by Region III inspectors and the resident inspectors. One Severity Level IV Non-Cited Violation was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be "Green" or be assigned a severity level after 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: Mitigating Systems

- Severity Level IV. A self-revealing issue was identified when licensee engineers noted, during a review, that they had miscalculated and therefore misreported in July 2001, the fault exposure time for a 1B auxiliary feedwater pump failure. The issue was more than minor because it caused the performance indicator to cross the Green-to-White threshold during later quarters. The licensee submitted the corrected data to the NRC in a special mid-quarter data submittal in August 2003 and the issue was entered into the licensee's corrective action system.

Because this issue affected the NRC's ability to perform its regulatory function, it was evaluated with the traditional enforcement process. The issue was determined to be a Severity Level IV Non-Cited Violation of 10 CFR 50.9. (Section 40A1.1)

B. Licensee-Identified Violations

A violation of very low safety significance, which was identified by the licensee has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and corrective action tracking number is listed in Section 40A7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 operated at or near full power throughout the inspection period with the exception of a power reduction to 85 percent on September 21, 2003, for turbine valve testing.

Unit 2 operated at or near full power throughout the inspection period with the exception of power reductions to 71 percent on July 6, 2003, for load following, and to 86 percent on July 13, 2003, for turbine valve testing.

1. REACTOR SAFETY

Cornerstone: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment (71111.04)

.1 Partial Walkdowns

a. Inspection Scope

The inspectors performed partial walkdowns of the accessible portions of trains of risk significant mitigating system equipment. These walkdowns were performed when the redundant trains or other related equipment were unavailable due to planned or emergent maintenance. The inspectors utilized the valve and electric breaker checklists 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 work orders (WOs) and condition reports (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 Technical Specifications (TS) and Updated Final Safety Analysis Report (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 the inspection were entered into the licensee's corrective action program.

The inspectors verified train alignment with the following four inspection samples:

- 2B essential service water (SX) train;
- 1B diesel generator (DG) train;
- 2A SX train; and
- 2A auxiliary feedwater (AF) train.

b. Findings

No findings of significance were identified.

.2 Complete Walkdowns

a. Inspection Scope

The inspectors conducted a complete system alignment inspection of the Unit 1 safety injection (SI) system. This system was selected because it played an important role in providing the high pressure injection mitigating function. The inspection sample consisted of the following activities:

- a walkdown of the system in the auxiliary building using the mechanical and electrical lineup checklists to verify proper alignment, component accessibility, availability, and current condition;
- a review of recent CRs to verify that there were no current operability concerns;
- a review of open WOs to verify that there were no conditions impacting availability and that deficiencies had been identified; and
- a review of normal and abnormal system operating procedures to verify that system alignment was properly controlled.

Documents reviewed during this inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

a. Inspection Scope

The inspectors conducted fire protection walkdowns which were focused on availability, accessibility, and the condition of fire fighting equipment, the control of transient combustibles and ignition sources, and on the condition and operating status of installed fire barriers. The inspectors selected fire areas for inspection based on their overall contribution to internal fire risk, as documented in the Individual Plant Examination of External Events with later additional insights, their potential to impact equipment which could initiate a plant transient, or their impact on the plant's ability to respond to a security event. The inspectors used the documents listed 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 also reviewed the installation of a new fire penetration between the turbine building and the 1A DG room. This inspection consisted of a walkdown of the installed penetration, a review of the penetration drawing and associated fire test report, and a review of the work package and applicable station procedures.

The following six sample areas were inspected by walkdowns:

- fire area 11.2A-2, 2A residual heat removal (RH) pump room;
- fire area 11.2B-2, 2A containment spray (CS) pump room;
- fire area 11.2C-2, 2B CS pump room;
- fire area 11.2D-2, 2B RH pump room;
- fire area 11.2A-2 and 11.2D-2, 2A and 2B RH pump rooms (during hot work in the area); and
- fire area 9.2-1, 1A DG room.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

Sections 1R11.1 through 1R11.7 represent completion of one sample for the biennial licensed operator requalification program inspection.

Section 1R11.8 represents completion of one sample for the quarterly testing/training activity inspection.

.1 Facility Operating History

a. Inspection Scope

The inspectors reviewed the plant's operating history from August 2001 through July 2003, to assess whether the Licensed Operator Requalification Training (LORT) program had identified and addressed operator performance deficiencies at the plant.

b. Findings

No findings of significance were identified.

.2 Licensee Requalification Examinations

a. Inspection Scope

The inspectors performed a biennial inspection of the licensee's LORT program. The inspectors reviewed the annual requalification operating test and biennial written examination material to evaluate general quality, construction, and difficulty level. The operating examination material reviewed consisted of six operating tests, each containing two dynamic simulator scenarios and seven job performance measures. The biennial written examinations reviewed consisted of approximately 40 open reference multiple choice questions. The biennial examinations were conducted in July and August 2003. The inspectors reviewed the methodology for developing the examinations, including the LORT program two year sample plan, probabilistic risk assessment insights, previously identified operator performance deficiencies, and plant modifications. The inspectors also reviewed the licensee's program and assessed the

level of examination material duplication during the current year annual examinations as compared to the previous year's annual examinations.

b. Findings

No findings of significance were identified.

.3 Licensee Administration of Requalification Examinations

a. Inspection Scope

The inspectors observed the administration of the requalification operating test to assess the licensee's effectiveness in conducting the test and to assess the facility evaluators' ability to determine adequate performance using objective, measurable performance standards. The inspectors evaluated the performance of one shift crew in parallel with the facility evaluators during four dynamic simulator scenarios. In addition, the inspectors observed licensee evaluators administer several job performance measures to various licensed crew members. The inspectors observed the training staff personnel administer the operating test, including pre-examination briefings, observations of operator performance, individual and crew evaluations after dynamic scenarios, and the post operating test crew de-brief by the training department evaluators. The inspectors evaluated the ability of the simulator to support the examinations. A specific evaluation of simulator performance was conducted and documented under Section 1R11.7, "Conformance With Simulator Requirements Specified in 10 CFR 55.46," of this report. The inspectors also reviewed the licensee's overall examination security program.

b. Findings

No findings of significance were identified.

.4 Licensee Training Feedback System

a. Inspection Scope

The inspectors assessed the methods and effectiveness of the licensee's processes for revising and maintaining its LORT program up to date, including the use of feedback from plant events and industry experience information. The inspectors reviewed the licensee's quality assurance oversight activities, including licensee training department self-assessment reports. The inspectors evaluated the licensee's ability to assess the effectiveness of its LORT program and their ability to implement appropriate corrective actions.

b. Findings

No findings of significance were identified.

.5 Licensee Remedial Training Program

a. Inspection Scope

The inspectors assessed the adequacy and effectiveness of the remedial training conducted since the previous annual requalification examinations and the training planned for the current examination cycle to ensure that they addressed weaknesses in licensed operator or crew performance identified during training and plant operations. The inspectors reviewed remedial training procedures and individual remedial training plans.

b. Findings

No findings of significance were identified.

.6 Conformance With Operator License Conditions

a. Inspection Scope

The inspectors reviewed the facility and individual operator licensees' conformance with the requirements of 10 CFR Part 55. The inspectors reviewed the facility licensee's program for maintaining active operator licenses and to assess compliance with 10 CFR 55.53 (e) and (f). The inspectors reviewed the procedural guidance and the process for tracking on-shift hours for licensed operators and which control room positions were granted credit for maintaining active operator licenses. The inspectors also reviewed 12 licensed operators' medical records maintained by the facility's nurse and assessed compliance with the medical standards delineated in American National Standard Institute/American Nuclear Society ANSI/ANS-3.4, "American National Standard Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants," and with 10 CFR 55.21 and 10 CFR 55.25. In addition, the inspectors reviewed the facility licensee's LORT program to assess compliance with the requalification program requirements as described by 10 CFR 55.59 (c).

b. Findings

No findings of significance were identified.

.7 Conformance With Simulator Requirements Specified in 10 CFR 55.46

a. Inspection Scope

The inspectors assessed the adequacy of the licensee's simulation facility (simulator) for use in operator licensing examinations and for satisfying experience requirements as prescribed in 10 CFR 55.46, "Simulation Facilities." The inspectors also reviewed a sample of simulator performance test records (i.e., transient tests, scenario test and discrepancy resolution validation test), simulator discrepancy and modification records, and the process for ensuring continued assurance of simulator fidelity in accordance with 10 CFR 55.46. The inspectors reviewed and evaluated the discrepancy process to ensure that simulator fidelity was maintained. Open simulator discrepancies were

reviewed for importance relative to the impact on 10 CFR 55.45 and 55.59 operator actions as well as on nuclear and thermal hydraulic operating characteristics. The inspectors conducted interviews with members of the licensee's simulator staff about the configuration control process and completed the Inspection Procedure 71111.11, Appendix C, checklist to evaluate whether or not the licensee's plant-referenced simulator was operating adequately as required by 10 CFR 55.46 (c) and (d).

b. Findings

No findings of significance were identified.

.8 Quarterly Testing/Training Activity

a. Inspection Scope

The inspectors observed an operating crew during an "out-of-the-box" requalification examination on the simulator. Specifically, the inspectors observed Scenario No. BR-9, "Respond to a Main Steam Line Break with Miscellaneous Malfunctions," dated August 6, 2003. The inspectors evaluated crew performance in the areas of:

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

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

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Periodic Evaluation (Biennial)

a. Inspection Scope

The inspector performed the following verifications:

- the periodic evaluation was completed within the time restraints defined in 10 CFR 50.65 (once per refueling cycle, not to exceed 2 years). Ensure that the licensee reviewed its goals, monitored Structures, Systems, and Components (SSCs) performance, reviewed industry operating experience, and made appropriate adjustments to the maintenance rule program as a result of the above activities;
- the licensee balanced reliability and unavailability during the previous refueling cycle, including a review of safety significant SSCs;
- (a)(1) goals were met, that corrective action was appropriate to correct the defective condition, including the use of industry operating experience, and that (a)(1) activities and related goals were adjusted as needed; and
- the licensee has established (a)(2) performance criteria, examined any SSCs that failed to meet their performance criteria, and reviewed any SSCs that have suffered repeated maintenance preventable functional failures including a verification that failed SSCs were considered for (a)(1).

The inspector examined the periodic evaluation report completed for the time period of May 2001 - October 2002. To evaluate the effectiveness of (a)(1) and (a)(2) activities, the inspectors examined a number of Braidwood CRs contained in the list of documents in the Attachment. In addition, the CRs were reviewed to verify that the threshold for identification of problems was at an appropriate level and the associated corrective actions were appropriate. Also, the maintenance rule program documents were reviewed. The inspectors verified that minor issues identified during this inspection were entered into the licensee's corrective action system.

The inspectors completed four inspection samples by focusing the inspection on the following systems:

- AF system;
- chemical and volume control (CV) system;
- RH system; and
- SX system.

In addition, the inspectors reviewed an engineering self-assessment that addressed the maintenance rule program implementation.

b. Findings

No findings of significance were identified.

.2 Routine Inspection

a. Inspection Scope

The inspectors reviewed the licensee's overall maintenance effectiveness for risk-significant mitigating 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;
- a partial walkdown of the selected system; and
- interviews with the appropriate system engineer.

The inspectors also reviewed whether the licensee properly implemented the Maintenance Rule, 10 CFR 50.65, for the 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:

- instrument power and
- reactor coolant system (RCS).

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 reviewed the following three sample activities:

- planned maintenance on the 2A CV pump coincident with adverse weather (severe thunderstorms);
- emergent maintenance on the 1B AF pump; and
- emergent troubleshooting to try to find the source of in-leakage into the Unit 1 RH system.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

.1 Periodic Evaluation

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:

- 1A and 1B SI pumps elevated discharge pressure;
- 1B AF pump elevated crankcase pressure;
- 1A CV pump oil leak;
- 2A SX high strainer differential pressure and low discharge pressure; and
- possible excessive loss rate of water from the spent fuel pool.

b. Findings

No findings of significance were identified.

- .2 (Closed) Unresolved Item (URI) 05000456/2003003-01; 05000457/2003003-01: Failure of the 1B diesel-driven AF pump to start during surveillance testing occurring on May 24, 2003.

This inspection was considered to be one sample of the operability evaluation inspection requirement.

The inspectors reviewed the licensee's root cause report and corrective actions associated with the May 24, 2003, failure to start of the 1B AF pump. This event was previously discussed in NRC Inspection Report 05000456/2003003; 05000457/2003003, Section 1R15.

The licensee identified that the governor oil reservoir was located too high with respect to the governor. This resulted in siphoning of the reservoir oil level to the point where there was insufficient oil available to properly operate the governor during an initial start. However, the licensee demonstrated that sufficient oil would be delivered to the reservoir during the initial start attempt, to successfully start the pump during a second, manual start. This second manual start was a required action in plant emergency response procedures should the AF pump fail to start when needed.

The misalignment between the oil reservoir and the governor was part of the pump vendor's original construction, although this orientation differed from that specified by the manufacturer of the governor subsystem. The licensee was unable to identify why the pump vendor had used this different orientation. A similar problem also existed on the 2B AF pump and on both diesel-driven AF pumps at the Byron Station.

The licensee had a previous failure to start on this same pump in November 2001. Subsequent to that event, the licensee had installed a system to monitor various pump parameters (including governor pressure) during pump starts. It was this monitoring system that enabled the licensee to identify the misorientation between the oil reservoir and the governor.

Interim corrective actions for this event included having plant operators monitor the governor oil reservoir level each shift. Should the oil level drop to a predefined point, the operators were instructed to start the pump to refill the reservoir. The licensee was planning a subsequent modification to both the 1B and 2B AF pumps to correct the orientation between the oil reservoir and the governor. The Byron station personnel were also aware of this event and were working on similar corrective actions.

This event did not constitute a violation of NRC requirements and this URI is considered closed.

1R16 Operator Workarounds (71111.16)

a. Inspection Scope

The inspectors reviewed an issue with failure of the 1A DG jacket water heater to operate in automatic, which would cause the operators to manually operate the system and may require an additional local action to be taken after an event. This condition had

not been entered into the licensee's operator workaround tracking system because it was a new problem that had been given a high priority for repair so that it would soon be repaired. The inspectors verified that the condition and the manual actions that would be required were not likely to affect the operability of the DG, would not significantly affect the operators' ability to respond to an event, and that operators were aware of the actions required. The inspectors also verified that the condition was repaired in a timely manner. Documents reviewed as part of this inspection are listed in the Attachment. This inspection was considered to be one sample of the operator workarounds inspection requirement.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the post maintenance testing activities associated with maintenance or modification of important mitigating, barrier integrity, and support systems to ensure that the testing adequately verified system operability and functional capability with consideration of the actual maintenance performed. The inspectors used the appropriate sections of the TS and UFSAR, as well as the documents listed in the Attachment, 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.

Five samples were completed by observing and evaluating testing subsequent to the following activities:

- emergent maintenance on the 1B AF pump;
- planned maintenance on the 1B RH pump;
- planned maintenance on the 2B CV pump;
- planned maintenance on the 2A SX pump; and
- planned maintenance on the 2A CS pump.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors witnessed selected surveillance testing and/or reviewed test data to verify that the equipment tested using the surveillance procedures met the TS, the UFSAR, and licensee procedural requirements, and demonstrated that the equipment was capable of performing its intended safety functions. The activities were selected based on their importance in verifying mitigating systems capability and barrier integrity.

The inspectors used the documents listed in the Attachment to verify that the testing met the frequency requirements; that the tests were conducted in accordance with the procedures, including establishing the proper plant conditions and prerequisites; that the test acceptance criteria were met; and that the results of the tests were properly reviewed and recorded.

Two samples were completed by observing and evaluating the following tests:

- Unit 2 moderator temperature coefficient at power; and
- 2A CS additive flow rate verification.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors completed three inspection samples by reviewing the following temporary modifications to risk significant systems, components and/or structures:

- installation of a freeze seal on the service water supply to the 2A CV pump cubicle cooler;
- installation of remote cameras in various locations in the U1 and U2 auxiliary building; and
- installation of temporary lead shielding on the 2B RH pump.

For each modification, the inspectors reviewed, as applicable, the associated 10 CFR 50.59 screening or safety evaluations, selected design bases documentation, the UFSAR, the TSs, and other documents listed in the Attachment. The inspectors verified that the modifications were installed and tested in accordance with the above documents and that associated related documents, such as critical control room drawings or operating procedures were revised as necessary. Specifically, the inspectors verified that the temporary modifications were implemented consistent with Exelon procedure CC-AA-112, "Temporary Configuration Changes," Revision 6. The inspectors verified that minor issues identified during this inspection were entered into the licensee's corrective action system.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01)

.1 Plant Walkdowns, Radiological Boundary Verification, Radiation Work Permit Reviews and Observations of Radiation Worker Performance

a. Inspection Scope

The inspectors conducted walkdowns of selected radiologically controlled areas within the plant to verify the adequacy of radiological boundaries and postings. Specifically, the inspectors walked down several radiologically significant work area boundaries (high and locked high radiation areas) in the Units 1 and 2 auxiliary building, the radwaste building, and the spent fuel pool and performed confirmatory radiation measurements to verify that these areas and selected radiation areas were properly posted and controlled in accordance with 10 CFR Part 20, licensee procedures, and the TS. The inspectors also reviewed the radiological conditions within those work areas walked down, to assess the radiological housekeeping and contamination controls.

b. Findings

No findings of significance were identified.

.2 High Radiation Area and Very High Radiation Area Access Controls

a. Inspection Scope

The inspectors reviewed the licensee's practices and records for the control of keys to locked high radiation areas and very high radiation areas, the use of access control guards to control entry into such areas, and the licensee's methods for independently verifying proper closure and latching of locked high radiation areas and very high radiation areas doors upon area egress. Additionally, radiological postings were reviewed, and access control boundaries were challenged by the inspectors throughout the plant to verify that high, locked high, and very high radiation areas were properly controlled.

b. Findings

No findings of significance were identified.

2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03)

.1 Rescue Capabilities During Use of One-Piece Atmosphere Supplying Respiratory Protection Devices

a. Inspection Scope

The inspectors reviewed the licensee's respiratory protection and confined space entry procedures and discussed their implementation relative to the requirements of

10 CFR 20.1703(f) for standby rescue persons whenever one-piece atmosphere supplying suits, or any combination of respiratory protection and personnel protective equipment were used which the wearer may have difficulty extricating himself.

The inspectors discussed with radiation protection management proposals for enhancing the radiation work permit and as-low-as-is-reasonably-achievable planning process and for developing safety plans for those jobs not performed in confined space atmospheres to formally address work provisions for standby rescuers.

b. Findings

No findings of significance were identified.

Cornerstone: Public Radiation Safety

2PS3 Radiological Environmental Monitoring and Radioactive Material Control Programs (71122.03)

.1 Review of Environmental Monitoring Reports and Data

a. Inspection Scope

The inspectors reviewed the 2002 Annual Radiological Environmental Operating Report. Sampling location commitments, monitoring and measurement frequencies, land use census, the vendor laboratory's Interlaboratory Comparison Program, and data analysis were assessed. Anomalous results including data, missed samples, and inoperable or lost equipment were evaluated. The review of the Radiological Environmental Monitoring Program (REMP) was conducted to verify that the REMP was implemented as required by the Offsite Dose Calculation Manual (ODCM), and associated TS, and that changes, if any, did not affect the licensee's ability to monitor the impacts of radioactive effluent releases on the environment. The most recent quality assessment of the licensee's REMP vendor was reviewed to verify that the vendor laboratory performance was consistent with licensee and NRC requirements. These activities represent three inspection samples.

b. Findings

No findings of significance were identified.

.2 Walkdowns of Radiological Environmental Monitoring Stations and Meteorological Tower

a. Inspection Scope

The inspectors conducted a walkdown of selected environmental air sampling stations and thermoluminescent dosimeters to verify that their locations were consistent with their descriptions in the ODCM and to evaluate the equipment material condition. The inspectors also conducted a walkdown of primary and back-up meteorological

monitoring sites to validate that sensors were adequately positioned and operable. The inspectors reviewed the 2002 Annual Radiological Environmental Operating Report to evaluate the onsite meteorological monitoring program's data recovery rates, routine calibration and maintenance activities, and non-scheduled maintenance activities. The review was conducted to verify that the meteorological instrumentation was operable and was calibrated and maintained in accordance with licensee procedures. The inspectors also reviewed indications of wind speed, wind direction, and atmospheric stability measurements to verify that the indications were available in the control room and that the instrument indications were operable. These activities represent two inspection samples.

b. Findings

No findings of significance were identified.

.3 Review of REMP Sample Collection and Analysis

a. Inspection Scope

The inspectors accompanied the licensee REMP technician to observe the collection and preparation of air filters, charcoal canisters, water and milk samples to verify that representative samples were being collected in accordance with procedures and the ODCM. The inspectors observed the technician perform air sampler field check maintenance to verify that the air samplers were functioning in accordance with procedures. Selected air sampler calibration and maintenance records for 2002 and 2003 were reviewed to verify that the equipment was being maintained as required. The environmental sample collection program was compared with the ODCM to verify that samples were representative of the licensee's release pathways. Additionally, the inspectors reviewed results of the vendor laboratory's Interlaboratory Comparison Program to verify that the vendor was capable of making adequate radio-chemical measurements. These activities represent two inspection samples.

The inspectors also met with representatives of the Illinois Emergency Management Agency to discuss issues regarding the composite water sampler located at Wilmington, Illinois. The inspectors also reviewed documents provided by Emergency Management Agency that addressed the same sampler issues.

b. Findings

No findings of significance were identified.

.4 Unrestricted Release of Material From the Radiologically Controlled Area

a. Inspection Scope

The inspectors evaluated the licensee's controls, procedures, and practices for the unrestricted release of material from radiologically controlled areas and conducted reviews to verify that: (1) radiation monitoring instrumentation used to perform surveys for unrestricted release of materials was appropriate; (2) instrument sensitivities were

consistent with NRC guidance contained in Inspection and Enforcement Circular 81-07 and Health Physics Positions in NUREG/CR-5569 for both surface contaminated and volumetrically contaminated materials; (3) criteria for survey and release conformed to NRC requirements; (4) licensee procedures were technically sound and provided clear guidance for survey methodologies; and (5) radiation protection staff adequately implemented station procedures. These activities represent two inspection samples.

b. Findings

No findings of significance were identified.

.5 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed a focus area self-assessment of the REMP and a selection of Nuclear Oversight assessments addressing issues involving the REMP to determine if problems were being identified and entered into the corrective action program for timely resolution. The inspectors also reviewed selected 2002 and 2003 CRs that addressed REMP deficiencies, to verify that the licensee had effectively implemented the corrective action by emphasizing that problems were identified, characterized, prioritized and corrected. This activity represents one inspection sample.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

Cornerstones: Mitigating Systems and Barrier Integrity

.1 Followup of a Previous Reporting Error

a. Inspection Scope

The inspectors reviewed an issue regarding misreported data that was not part of the inspectors' performance indicator verification inspection. This review was not considered an inspection sample in the revised oversight program.

b. Findings

Introduction: A Severity Level IV NCV of 10 CFR 50.9 was self-revealed when licensee engineers noted, during a review, that they had miscalculated, and therefore misreported, the fault exposure time for a previous 1B AF pump failure. The issue was more than minor because it caused the performance indicator to cross the Green-to-White threshold during later quarters.

Description: On July 29, 2003, during a review of accumulated unavailability resulting from a recent failure of the 1B AF pump, licensee engineers discovered that they had miscalculated the fault exposure time from a previous pump failure on April 20, 2001. The April 2001 failure involved a valve that failed to stroke due to foreign material and the licensee was unable to establish exactly how long the valve had been in that condition. Therefore, the performance indicator reporting guidelines in effect at the time required that the fault exposure time be reported as half the time back to the last time that equipment availability had been successfully demonstrated. The licensee had reviewed surveillance records and reported the fault exposure time as half way back to the last previous performance of surveillance test 1BwOS SX-Q1, "Unit One Essential Service Water System Manual Ball Valve Cycle Quarterly Surveillance," or 155.9 hours. This fault exposure time was reported in the second quarter performance indicator data reported to the NRC in July 2001.

On July 29, 2003, licensee engineers discovered that the SX-Q1 surveillance did not include stroking of the valve that had failed and that they should have used the time half way back to the last previous performance of surveillance test 1BwOSR 5.5.8.SX-1B, "Essential Service Water Train B Valve Stroke Quarterly Surveillance," or 286.9 hours. This corrected fault exposure time was reported to the NRC in August 2003 in a special mid-quarter report.

Analysis: In the fourth quarter of 2001, the Braidwood Unit 1 AF safety system unavailability performance indicator crossed the threshold from the Green area into the White area because of additional failures after the April 2001 problem. The licensee originally reported that the performance indicator crossed back into the Green area in the third quarter of 2002 and remained in the Green area through the second quarter of 2003. However, with the corrected fault exposure time, the performance indicator actually remained in the White area from the fourth quarter of 2001 through the second quarter of 2003 (and was still in the White area as of the end of this inspection period). Therefore the licensee misreported the color of the performance indicator for a total of four quarters from the third quarter of 2002 through the second quarter of 2003.

This issue was not suited for SDP analysis and was evaluated with the traditional enforcement process. The NRC considered errors in performance indicator data reporting which cause the performance indicator to cross the Green-to-White threshold to be more than minor because they have the potential for impacting the NRC's ability to perform its regulatory function. In this case, the NRC's performance assessment for Unit 1, completed by the NRC and reported in the Annual Assessment Letter - Braidwood Stations, Units 1 and 2 (Report 50-456/03-01; 50-457/03-01), dated March 4, 2003, was based on the incorrect information. It should be noted that the appropriate supplemental inspections were completed in March and December 2002.

Enforcement: Paragraph (a) of 10 CFR 50.9, "Completeness and Accuracy of Information," required that information provided to the Commission by the licensee be complete and accurate in all material respects. Contrary to the above, in July 2001, the licensee provided inaccurate performance indicator data to the NRC, and failed to correct the data in subsequent quarterly data submittals until August 2003. The failure to provide accurate information was material because it caused the NRC to incorrectly classify the licensee's performance as reported in the annual assessment letter issued

in March 2003. This issue is classified as a Severity Level IV Violation in accordance with Supplement VII, Section D.3, of the NRC Enforcement Policy, NUREG 1600. This Severity Level IV Violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy, (NCV 05000456/2003006-01). This violation was in the licensee's corrective action system as CR 169494 and was assigned to the mitigating system cornerstone for Unit 1. The licensee's immediate corrective actions included submission of the corrected information and a review of all the performance indicator data.

.2 Annual Verifications - Reactor Safety Strategic Area

a. Inspection Scope

The inspectors reviewed documents listed in the Attachment to verify that the licensee had corrected reported performance indicators data, in accordance with the criteria in Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 2. The inspectors verified that minor issues identified during the inspection were entered into the licensee's corrective action system. The inspectors completed six samples by verifying the following performance indicators:

Unit 1

- safety system unavailability - AF system for the period from October 1, 2002 to June 30, 2003;
- safety system functional failures for the period from July 1, 2002 to June 30, 2003; and
- RCS specific activity for the period from July 1, 2002 to June 30, 2003.

Unit 2

- safety system unavailability - AF system for the period from October 1, 2002, to June 30, 2003;
- safety system functional failures for the period from July 1, 2002, to June 30, 2003; and
- RCS specific activity for the period from July 1, 2002 to June 30, 2003.

b. Findings

No findings of significance were identified.

The inspectors identified that the licensee had submitted the incorrect information for the Unit 1 RCS activity performance indicator. Specifically, the measured activity November 2002 was incorrectly entered as 2.96E-4 instead of 2.86E-4 microCuries per gram. The 2.96E-4 value was actually data from October 2002. This error was considered a minor issue because it did not result in the performance indicator crossing a threshold. The licensee intended to correct the data in the next quarterly performance indicator data submittal. This issue was entered into the licensee's corrective action system as CR 170908, and reported to the industry as Institute of Nuclear Power Operations Operating Experience 16943.

.3 Clarification of Previously Reviewed Performance Indicators

The inspectors noted that the performance indicators reviewed were not clearly stated in previous inspection reports. Therefore, the following clarifications are provided:

- For inspection report 50-456/03-02; 50-457/03-02, the inspectors reviewed the following performance indicators for both Unit 1 and Unit 2:
 - unplanned scrams per 7000 critical hours; and
 - safety system unavailability, RH system.
- For inspection report 05000456/2003003; 05000457/2003003, the inspectors reviewed the following performance indicators for both Unit 1 and Unit 2:
 - unplanned scrams with loss of normal heat removal;
 - safety system unavailability of emergency alternating current power systems; and
 - RCS leakage.

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 system at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Minor issues entered into the licensee's corrective action system as a result of inspectors' observations are generally denoted in the Attachment.

b. Findings

No finding of significance were identified.

.2 Adverse Trend In Maintenance Performance Issues (Annual Sample)

Introduction

Since January 2003, the licensee has identified numerous examples of maintenance rework, due to weaknesses in work planning and human performance. Collectively, these issues were documented in the following CRs:

- CR 157334, "Potential Trend–Rework Issues during April 2003," May 5, 2003;
- CR 167010, "Ineffective Corrective Actions–Adverse Trend in Rework," July 10, 2003; and
- CR 167982, "Potential Trend In Maintenance Performance Issues," July 17, 2003.

Many of these problems were similar to problems encountered during DG work in late 2002. The inspectors' review of these earlier events was documented in Inspection Report 50-456/02-09; 50-457/02-09. The inspectors reviewed the 2003 events, as one sample as part of the annual sample review of the licensee's problem identification and corrective action program.

a. Effectiveness of Problem Identification

(1) Inspection Scope

The inspectors reviewed CRs 157334, 167010, and 167982, and several additional CRs generated over the past year, documenting the adverse trend and the specific events comprising the trend. The inspection focused on whether the licensee's identification of the problems were complete, accurate, and timely, and whether the extent of condition and any generic implications were appropriately considered. The specific documents are contained in the list of documents reviewed which is attached to this report.

(2) Issues

The inspectors identified that the licensee had appropriately captured the issues for the following events occurring in 2003:

- A Notice of Enforcement Discretion for the 1B RH pump due to significant work delays caused by several human performance and work planning issues;
- The over pressurization and overtorqueing of the 1B DG jacket water system during a planned work window;
- A mis-installed coupling for the 1B AF pump blower bearing assembly during planned maintenance, which resulted in additional system unavailability;
- A mis-wired limit switch that resulted in the inoperability of the 2A CV pump mini-flow valve (valve 2CV8111); and
- An oil leak from the outboard bearing of the 1A CV pump, caused by tool damage to the bearing oil seals during installation, which resulted in the pump being declared inoperable.

Each event was either self-revealing, identified through equipment checks and/or were self-reported. The associated maintenance problems were identified at a low threshold and entered into the corrective action program. Because of the similarity of the 2003 issues to those from 2002, the licensee performed additional evaluations to identify the cause of the recurrent trend.

b. Prioritization and Evaluation of Issues

(1) Inspection Scope

The inspectors reviewed the following licensee evaluations:

- A common cause analysis performed in response to CR 157334;
- A root cause report performed in response to CR 167010; and
- A common cause evaluation performed in response to CR 167892.

The inspectors also reviewed the specific evaluations performed in response to those 2003 events previously discussed. Specifically, the inspectors reviewed how the licensee had arrived at the overall conclusions and whether these conclusions were appropriate. In particular, the inspectors evaluated whether the licensee had appropriately considered the results of the evaluations conducted for the 2002 events.

(2) Issues

The licensee identified that inadequate work practices (including human performance) and poor process work management (work planning and preparation) were the cause of these events. These findings were consistent with the specific evaluations performed for the individual events occurring in 2002 and 2003. However, the licensee also concluded that these events were recurring, primarily because maintenance management was not reinforcing the expected standards of behavior. In the earlier events, the licensee had implicated the workers as being the primary cause of the events and had taken corrective actions accordingly. This meant that the lessons learned were often tailgated with the workers, but efforts to ensure long term reinforcement of these lessons by maintenance supervision may not have occurred. For example, poor verification practices by the workers caused the mis-wiring of the 2CV8111 limit switch. However, the licensee later identified that the poor practice resulted primarily because maintenance supervision had not enforced the expected standards in the plant. The overall findings were documented in the licensee's corrective program as CR 177357.

The inspectors noted that the licensee had reviewed related self-assessments during the evaluations of the 2003 events. This practice was a recent change implemented in response to previous concerns identified by the inspectors while reviewing the 2002 DG events.

c. Effectiveness of Corrective Actions

(1) Inspection Scope

The inspectors reviewed the licensee's corrective actions for the individual events and for the issues identified in the above common and root cause evaluations.

(2) Issues

The inspectors noted that the corrective actions for the individual events were appropriate. However, as stated above, these actions were predicated on the workers being the primary cause of the events and not on whether supervisory oversight had been effective. On July 26, 2003, station management discussed the preliminary findings of the above evaluations with the entire maintenance department. This meeting was one of several interim corrective actions to improve overall maintenance performance. Other actions included having maintenance supervisors spend more time in the plant, specifically interrupting work activities to verify that workers understood the expectations. As part of the resolution for CR 177357, the licensee planned to perform additional root cause evaluations to identify why maintenance supervision had not been re-enforcing the expected behavior.

4OA3 Event Followup (71153)

The inspectors completed five inspection samples in this area.

- .1 (Closed) Licensee Event Report (LER) 05000457/2003-001-00: Inadequate Enforcement of the Maintenance Fundamentals Results in the Inoperability of the 2A Train of the CV System for 12 Days.

The inspectors reviewed the LER, related CRs and other associated documents as listed in the Attachment at the end of this report. The inspectors also discussed the event with appropriate members of the licensee's maintenance, engineering and operating staff.

On July 21, 2003, the licensee identified that the limit switch lead for the 2A CV pump mini-flow isolation valve, 2CV8111, was lifted and taped. This lead had not been re-landed following previous testing occurring on July 9, 2003. The lifted lead prevented the valve from automatically closing following the switch over of the emergency core cooling suction source from the refueling water storage tank to the containment recirculation sump. Specifically, isolating the mini-flow line prevented inadvertent pumping of the water from the containment sump to areas outside the containment building. Although the valve would not have automatically closed, it was capable of manual closure, which was a defined contingency action in station emergency operating procedure 2BwEP ES-1.3, Revision 102, "Transfer to Cold Leg Recirculation—Unit 2."

The licensee also identified that the post-maintenance testing occurring after the July 9, 2003, work did not detect this problem. This testing consisted of stroking the valve which verified proper valve movement, but did not test the auto-close circuitry.

The licensee's corrective actions, as described in the LER, included restoring the limit switch lead for the 2CV8111 valve and discussing the event with the maintenance staff. Additionally, the licensee was revising the post-maintenance testing requirements to require that circuit continuity checks be performed after any alteration of motor operated valve circuitry.

The inspectors determined that this licensee-identified issue was more than minor because it was caused by performance deficiencies associated with the attributes of equipment performance, configuration control and human performance. These deficiencies affected the mitigating systems cornerstone objective of providing long term core cooling following a loss of coolant accident. The human performance objective was not met, as neither the workers performing the July 2003 work nor the post maintenance testing identified the un-landed lead.

The inspectors determined that the issue was of very low safety significance (Green) in the SDP Phase 1 Screening Worksheet of Inspection Manual Chapter 0609, Appendix A, Attachment 1. Specifically, the un-landed lead did not result in an actual loss of the long term core cooling safety function. This function was accomplished primarily through manual alignment of the emergency core cooling system by plant operators, with some automatic actions. As stated above, there was an existing contingency to manually align those valves that did not automatically align as required.

The licensee entered this item into its corrective action system as CR 168478. The enforcement aspects of this issue are discussed in Section 4OA7. This LER is closed.

.2 Indications of Fuel Pin Leak on Unit 2

a. Inspection Scope

During the week ending July 5, 2003, the licensee noted an increasing trend on Unit 2 RCS Xenon-133 activity, and instituted an investigation, which included an increased sampling frequency to daily samples. On July 8, 2003, the licensee noted a sudden significant increase (by about a factor of ten) in Xenon-133 activity. The activity reached the point where the licensee entered its abnormal operating procedures for a potential fuel pin leak. The licensee established a Failed Fuel Monitoring Team, increased RCS sampling frequency to shiftly, and took other actions in accordance with established procedures. The inspectors monitored RCS sample results and actions taken by the monitoring team, including the development of contingencies and power maneuvering plans. A review of RCS sample results showed that Xenon-133 activity stabilized at about ten times its original level but that Iodine activity levels did not increase significantly. The licensee determined that the activity levels indicated a potential fuel pin leak with a very tight crack size. The inspectors verified that the RCS activity levels never approached TS limits. This potential Unit 2 fuel pin leak is in addition to the ongoing Unit 1 leak previously discussed in Inspection Report 05000456/2003003; 05000457/2003003, Section 4OA3.4. Documents reviewed as part of this inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

.3 Response to Northeastern United States Blackout

a. Inspection Scope

On August 15, 2003, the inspectors reviewed the plant's response to the electrical grid disturbances caused by the northeastern United States blackout. The inspectors reviewed control room logs and chart recorders, interviewed operators, and reviewed other records to verify that the plant and operators responded as expected. Documents reviewed as part of this inspection are listed in the Attachment. In addition, the inspectors verified that the licensee did not plan on performing any production risk activities and that there were no surveillances that were approaching their respective critical due dates. The inspectors verified that minor issues identified by both the licensee and NRC were entered into the corrective action system.

b. Findings

No findings of significance were identified.

.4 Potential Error in Reactor Thermal Power Calculation Due To Feedwater Flow Signal Noise

On August 31, 2003, the licensee reported to the NRC, via the Emergency Notification System, in accordance with 10 CFR 50.72, that Unit 2 had potentially exceeded its maximum licensed thermal power level of 3586.6 megawatts thermal, as stated in License Condition 2.C.(1), by up to 0.8 percent, on at least one occasion since a power uprate in 2001. Additional information was provided to the NRC on September 2, 2003, via the Emergency Notification System. The issue involved potential signal noise problems in the Advanced Measurement and Analysis Group (AMAG) ultrasonic feedwater flow detectors on both units. These detectors provide correction factors that are incorporated into the calorimetric thermal power calculations. The licensee reduced thermal power output by the appropriate amount and removed the AMAG correction factors from the calorimetric calculation. The licensee entered this issue into its corrective action system as CRs 173548 and 173819. The NRC was previously reviewing similar issues at the Byron Station as discussed in Inspection Report 50-454/03-02; 50-455/03-02, Section 4OA2.2. Since the NRC's review of this issue was still ongoing, this issue is a URI (05000457/2003006-02).

.5 Potential Error in Reactor Thermal Power Calculation Due To Incorrect Heat Input Data

On September 3, 2003, the licensee reported to the NRC, via the Emergency Notification System, in accordance with 10 CFR 50.72, that both Unit 1 and Unit 2 had potentially exceeded their maximum licensed thermal power level limits of 3586.6 megawatts thermal, as stated in License Condition 2.C.(1), by up to 0.011 percent, on several occasions since power uprates were made to both units in 2001. This issue involved information provided by NASL-03-6 [Westinghouse Nuclear Safety Advisory Letter], in which errors were found in heat input values in the plant calorimetric calculation. The licensee reduced thermal power output by the appropriate amount and updated the calorimetric calculation to account for the errors. The licensee entered this issue into its corrective system as CR 173182. This issue involved a different cause, but a similar effect, as the one discussed above in Section 4OA3.4. Since the NRC's review of these issues were still ongoing, this issue is a URI (05000456/2003006-03; 05000457/2003006-03).

4OA4 Cross-Cutting Aspects of Findings

A licensee-identified finding described in Section 4OA3.1 of this report had, as its primary cause, a human performance deficiency, in that licensee electricians failed to land a lead on a limit switch following testing on the 2CV8111 valve, which resulted in it being unable to perform an automatic safety function.

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 October 6, 2003. The

inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

.2 Interim Exit Meetings

Interim exits were conducted for:

- Radiation Protection inspection with Mr. T. Joyce on July 11, 2003;
- Maintenance Effectiveness with Mr. T. Joyce on August 15, 2003; and
- Biennial Operator Requalification Program with Mr. M. Pacilio on August 29, 2003.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Policy, NUREG 1600, for being dispositioned as an NCV.

Cornerstone: Mitigating Systems

Technical Specification 3.5.2 required that both emergency core cooling system trains be operable when the plant is in Modes 1, 2 or 3. With one train inoperable, the licensee is required to return the train to operable status within 7 days. One train consisted of a charging, SI and RH pump. As described in LER 05000457/2003-001-00 and in Section 4OA3.1 of this report, while in Mode 1, on July 21, 2003, the licensee identified that the 2A CV pump was inoperable for 12 days due to the inability of its mini-flow isolation valve to automatically close, as required, during the transition to long term core cooling. This auto-closure function was disabled after an electrical lead associated with the valve's limit control switch, was removed during maintenance on the valve occurring on July 9, 2003. This condition was contrary to TS 3.5.2. The licensee entered the issue into its corrective action system as CR 168478.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

M. Pacilio, Site Vice President
T. Joyce, Plant Manager
E. Stefan, Regulatory Assurance - NRC Coordinator
R. Blaine, Radiation Protection Manager
D. Burton, Licensed Operator Requalification Training Lead Instructor
G. Dudek, Operations Manager
C. Dunn, Site Engineering Director
C. Gayheart, Shift Operations Superintendent
R. Gilbert, Nuclear Oversight Manager
F. Lentine, Design Engineering Manager
R. Linthicum, Engineering Programs - Probabilistic Risk Assessment
D. Meyers, Training Director
A. Ronstadt, Site Maintenance Rule Coordinator
K. Root, Regulatory Assurance Manager
B. Spahr, Operations Training Manager
B. Stoffels, Maintenance Manager

Nuclear Regulatory Commission

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

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000456/2003006-01	NCV	Failure to Provide Accurate Performance Indicator Data to the NRC (Section 40A1.1)
05000457/2003006-02	URI	Potential Error in Reactor Thermal Power Calculation Due to Feedwater Flow Signal Noise (Section 40A3.4)
05000456/2003006-03; 05000457/2003006-03	URI	Potential Error in Reactor Thermal Power Calculation Due to Incorrect Heat Input Data (Section 40A3.5)

Closed

05000456/2003003-01; 05000457/2003003-01	URI	Failure of 1B Diesel-Driven Auxiliary Feedwater Pump to Start During Routine Surveillance (Section 1R15.2)
05000456/2003006-01	NCV	Failure to Provide Accurate Performance Indicator Data to the NRC (40A1.1)

05000457/2003-001-00 LER Inadequate Enforcement of the Maintenance Fundamentals Results in the Inoperability of the 2A Train of the Chemical Volume and Control System for 12 Days (Section 4OA3.1)

Discussed

None.

LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety but rather that selected sections 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.

1R04 Equipment Alignment

1BwEP-0; Reactor Trip or Safety Injection [SI] Unit 1, Revision 101

BwOP AF-E2; Electrical Lineup - Unit 2 Operating; Revision 5

BwOP AF-M2; Operating Mechanical Lineup Unit 2; Revision 6

BwOP DG-E2; Electrical Lineup - Unit 1 1B Diesel Generator [DG]; Revision 2E4

BwOP DG-M2; Operating Mechanical Lineup Unit 1 1B DG; Revision 10

BwOP SI-1; SI System Startup; Revision 14

BwOP SI-E1; Electrical Lineup - Unit 1 Operating; Revision 7

BwOP SI-M1; Operating Mechanical Lineup Unit 1; Revision 15

BwOP SX-3; Essential Service Water [SX] System Fill and Vent; Revision 12

BwOP SX-E2; Electrical Lineup - Unit 2 SX System; Revision 8

BwOP SX-M2; Operating Mechanical Lineup Unit 2; Revision 19

Unit 1 and 2 Standing Order 03-001; Spurious Valve Operation Group Valve Re-energization; May 31, 2003

CR 104897; Procedure Inadequacy Causing Improper Credit of Surveillance; April 23, 2002

CR 104918; B4 Trend Code: Eagle timers Out of Tolerance; April 23, 2002

CR 105616; BwVSR 5.5.8.SI.3 Has Incorrect Flow Coefficient Table; April 27, 2002

CR 108267; 2D Accumulator Appears to be Losing 1-2 Percent Level Per Day; May 25, 2002

CR 155667; Returning 1A Auxiliary Feedwater [AF] Pump to Service After Drain and Fill of SX; April 24, 2003

CR 175816; NRC-Identified - 2HS-AF134 Location Error (In AF-E2 Lineup);
September 15, 2003 [NRC-Identified]

1R05 Fire Protection

BwSC 2100-1; Penetration Seal Installation and Inspection; Revision 0E1

Byron/Braidwood Fire Protection Report; Revision 20

Braidwood Station Pre-Fire Plans

OP-AA-201-009; Control of Transient Combustible Material; Revision 2

Transco Products Test Report #TR-217; Fire and Hose Stream Test of a 5" Thick
#TCO-001 Cement Seal for Electrical Penetrations; Revision 0

1R11 Licensed Operator Requalification Program

Braidwood Station 2003 Written and Operating Requalification Training (LORT)
Examinations

TQ-AA-106; Braidwood LORT Program Description

TQ-AA-106-0114; Simulator Demonstration Examination Crew Competency Evaluation
Form, Revision 0 (for evaluated crew)

TQ-AA-106-0113; Simulator Individual Competency Evaluation Form; Revision 0 (for
individuals evaluated during the inspection week)

TR-AA-201; Examination Security and Administration

Curriculum Review Committee Meeting Agenda (multiple from August 20, 2001 through
May 14, 2003)

LORT End of Cycle Reports (Multiple from Cycle 6, 2001 through Cycle 4, 2003)

LORT Examination Report for 2002

Braidwood Station LORT Long Range Training Plan

LS-AA-126; Braidwood 2003 LORT Self-Assessment Report

TQ-AA-301; Simulator Configuration Management; Revision 3

TQ-AA-301-0301; Simulator Prioritization Maintenance, Modification, and
Enhancements; Revision 1

TQ-AA-303; Controlling Simulator Core Updates and Thermal-Hydraulic Model Updates;
Revision 3

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OP-AA-103-104; Reactivity Management Controls; Revision 0

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August 23, 2001

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Deficiencies; July 11, 2002

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CR 155728; Unit 1 Reactor Vessel Lower Head condition (Rust Patch); April 17, 2003

CR 155919; Loss of Instrument Bus 111 (Reason Unknown); April 26, 2003

CR 157478; System Instrument Power Exceeds Maintenance Rule Performance Criteria - Inverter Failure; May 6, 2003

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1BwEP ES-1.3; Transfer to Cold Leg Recirculation; Revision 101

1BOA PRI-7; SX Malfunction; Revision 100

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Rebuild; Revision 4

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CR 164672; Repeat Maintenance - Excessive Oil Leak 1A Centrifugal Charging Pump - Unplanned Limiting Condition for Operation Entry; June 24, 2003

CR 164897; Both SI Pump Discharge Pressure Main Control Board Indications Read About 450 Pounds; June 25, 2003

CR 165083; Oil Leak on the 1CV01PA Thrust Bearing Housing; June 24, 2003

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CR 167710; 1B AF Pump Assembly Issue (Hi Crankcase Pressure); July 15, 2003

CR 169834; 2A SX Strainer Alarm, Concern for Lake Chemistry; July 31, 2003

CR 169943; Low SX System Pressure Due to High 2A Strainer Discharge Pressure; August 1, 2003

CR 170051; Switch Calibrations Swapped; August 1, 2003

CR 171470; NRC Follow-up Questions Regarding 1B AF Pump [NRC-Identified]

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CR 168147; Radiation Protection Zone Stations Don't Comply with Seismic Housekeeping Procedures; July 17, 2003 [NRC-Identified]

CR 168433; NRC Identified Various Issues with Seismic Housekeeping; July 17, 2003 [NRC-Identified]

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BRW-SESV-1999-803; Procedure CC-AA-401, Installation and Control of Temporary Shielding; Revision 0

CC-AA-112; Temporary Configuration Changes; Revision 6

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Waste; January 9, 2003

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CR 165050; Issues Identified During REMP Focused Area Self Assessment; June 25, 2003

CR 166488; Date Set for Flow Totalizer was 3 Days Too Late; July 7, 2003

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40A2 Identification and Resolution of Problems

CR 163877; While Bolting-up the 1B DG Jacket Water Pump Discharge Flange, it Cracked During the Last Torque Pass of 200 Foot Pounds

CR 167311; Improper Execution of Work During AF Diesel LCOAR; July 11, 2003

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CR 170217; Maintenance Opportunities to Improve Work Execution; July 31, 2003

CR 170533; Potential for Human Performance and Fundamental Errors; August 1, 2003

CR 171803; Supervisor Observed Electricians Performing CV Step Incorrectly; August 11, 2003

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2BwOA PRI-4; High Reactor Coolant Activity Unit 2; Revision 54A

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CR 166634; Elevated Unit 2 RCS Xenon-133 Due To a Fuel Leak; July 8, 2003

CR 168470; 2CV8111 Circuit Voltage Not Normal (Valve Circuit Problem); July 21, 2003

CR 168478; 2CV8111 Limit Switch Found With Lifted/Taped Lead; July 21, 2003

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

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CR 173182; Potential to Exceed Rated Thermal Power Limits; August 26, 2003

CR 173548; Advanced Measurement and Analysis Group [AMAG] Problems Identified at Byron - Applicable to Braidwood; August 28, 2003

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CR 173819; AMAG Signal Noise Potential Effect on Reactor Power Calorimetric; August 31, 2003

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Westinghouse Electric Company; Technical Bulletin TB-03-6; Crossflow Ultrasonic Flow Measurement System Signal Issues; September 5, 2003

Operator Aid 99-044; Feedwater Flow Constants - Unit 1; Revision 13

Operator Aid 99-045; Feedwater Flow Constants - Unit 2; Revision 15

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
AF	Auxiliary Feedwater
AMAG	Advanced Measurement and Analysis Group
ANSI/ANS	American National Standard Institute/American Nuclear Society
ASME	American Society of Mechanical Engineers
BwAP	Braidwood Administrative Procedure
BwAR	Braidwood Annunciator Response Procedure
BwCA	Braidwood Contingency Action Procedure
BwEP	Braidwood Emergency Procedure
BwOA	Braidwood Abnormal Operating Procedure
BwOP	Braidwood Operating Procedure
BwOS	Braidwood Operating Surveillance Procedure
BwOSR	Braidwood Operating Surveillance Requirement Procedure
BwSC	Braidwood Site Engineering Construction Procedure
BwVSR	Braidwood Engineering Surveillance Requirement Procedure
CFR	Code of Federal Regulations
CR	Condition Report
CS	Containment Spray
CV	Chemical and Volume Control
DG	Diesel Generator
LER	Licensee Event Report
LORT	Licensed Operator Requalification Training
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
RCS	Reactor Coolant System
REMP	Radiological Environmental Monitoring Program
RH	Residual Heat Removal
SDP	Significance Determination Process
SI	Safety Injection
SSC	Structures, Systems, and Components
SX	Essential Service Water
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
WO	Work Order
WR	Work Request