

November 14, 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 PROBLEM IDENTIFICATION AND RESOLUTION INSPECTION  
REPORT 50-456/2003009(DRP); 50-457/2003009(DRP)

Dear Mr. Skolds:

On October 15, 2003, the U. S. Nuclear Regulatory Commission (NRC) completed a team inspection at the Braidwood Station, Units 1 and 2. The enclosed report documents the inspection findings which were discussed on October 15, 2003, with Mr. Thomas Joyce and other members of your staff.

This inspection was an examination of activities conducted under your license as they relate to identification and resolution of problems, and compliance with the Commission's rules and regulations and with the conditions of your operating license. Within these areas, the inspection involved selected examination of procedures and representative records, observations of activities, and interviews with personnel. No violations or findings were identified.

This inspection was conducted on an accelerated schedule because of past findings relating to failure to promptly identify and implement effective corrective action for significant equipment performance problems, which led to a degraded condition for the Mitigating Systems Cornerstone. As a result of this inspection, the team determined that substantial efforts had been made at the Braidwood Station to address the previously-identified issues and that these efforts appeared to be successful. On the basis of the samples selected for review, the team concluded that, in general, your corrective action program had adequately identified, evaluated, and resolved conditions adverse to quality. The team made several observations relating to timeliness and effectiveness of problem identification and resolution as detailed in the enclosed report.

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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 50-456/2003009(DRP); 50-457/2003009(DRP)  
w/Attachment: Supplemental Information

cc w/encl: Site Vice President - Braidwood  
Braidwood Station Plant Manager  
Regulatory Assurance Manager - Braidwood  
Chief Operating Officer  
Senior Vice President - Nuclear Services  
Vice President - Operations Support  
Vice President - Licensing and Regulatory Affairs  
Director Licensing  
Manager Licensing - Braidwood and Byron  
Senior Counsel, Nuclear, Mid-West Regional  
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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report Nos: 50-456/2003009(DRP); 50-457/2003009(DRP)

Licensee: Exelon Generation Company, LLC

Facility: Braidwood Station, Units 1 and 2

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

Dates: September 22 through October 15, 2003

Inspectors: T. Tongue, Project Engineer, Team Leader  
S. Ray, Senior Resident Inspector  
B. Jorgensen, Consultant

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

Enclosure

## SUMMARY OF FINDINGS

IR 05000456/2003009(DRP), 05000457/2003009(DRP); on 09/22-10/15/03; Braidwood Station; Units 1 and 2. Accelerated Identification and Resolution of Problems inspection.

The inspection was conducted by a region-based reactor project engineer, a senior resident inspector and a consultant. No violations or findings of significance were identified.

### Identification and Resolution of Problems

Issues which were identified during the previous problem identification and resolution (PI&R) inspection completed in February 2002 and for Supplemental Inspection 95002 "Inspection For One Degraded Cornerstone or Any Three White Inputs In A Strategic Performance Area," completed in December 2002 were specifically re-examined. Significant actions had been taken to address these issues, which appeared to be effective.

The team concluded that the licensee adequately identified, evaluated, and resolved problems within the requirements of their corrective action program (CAP). The program was a large-volume, low threshold program, supported by a computerized data base and primarily administered by departmental CAP Coordinators. The significance threshold for entering issues into the corrective action program appeared to be appropriate.

The team developed a number of observations, including:

- The team noted three performance trends which had not been identified by the licensee in a timely manner. This resulted in delayed corrective actions.
- Assessments of numerous radiation protection (RP) problems from outage A1R10 found that many resulted, in part, from unanticipated conditions, which caused a significant mismatch of resources to workload within the fixed schedule. The licensee acted to improve future RP resource flexibility, but did not address workload adjustment.
- The licensee continued to experience minor but recurring problems in some of the areas identified during the previous PI&R inspection in February 2002. While not trending in a negative direction, examples of human performance problems continued to be noted with foreign material exclusion control, rework, and configuration control.
- Through interviews and observations, the team concluded that Braidwood had established a safety-conscious work environment where people were not reluctant to raise issues. Previously identified issues relating to staff unfamiliarity with the then-new processes for entering items into the computerized corrective action program, including ability to track and trend condition- report-related data, have been addressed in part by software improvements and by increased familiarity with the system.
- The team determined that the licensee had completed essentially all of the corrective actions identified in the degraded cornerstone root cause investigation.

## OTHER ACTIVITIES (OA)

### 4OA2 Identification and Resolution of Problems (71152B)

#### .1 Effectiveness of Problem Identification

##### a. Inspection Scope

The team conducted a review and assessment of the licensee's processes for identifying and correcting problems at the Braidwood Station. The team reviewed selected plant procedures and program description handbooks, interviewed plant and contractor personnel, and attended various station meetings to understand the station's processes for initiating the corrective action program (CAP) and related activities. The team also reviewed Nuclear Oversight (NOS) Assessments and Operating Experience (OPEX) Reports to determine if problems were identified at the proper threshold and entered into the CAP process.

The team selected a number of condition reports (CRs) and other corrective action documents, primarily generated since the last Problem Identification and Resolution (PI&R) inspection, for more in-depth review.

To assess equipment monitoring, evaluate maintenance rule implementation, and to identify if any issues were missed by the licensee, the team reviewed the past performance of three plant systems. The systems selected were containment spray (CS), station battery/125 volt D.C. system, and auxiliary building ventilation systems. As part of this assessment, the team interviewed system engineers, reviewed system health reports and system monitoring programs, and performed partial system walkdowns.

From a list of station and departmental self-assessments and audits, the team conducted a review to determine whether the audit and self-assessment programs were effectively managed, and adequately covered the subject areas. In addition, the team interviewed licensee staff regarding the audit and self-assessment programs.

The specific documents reviewed are listed in an Attachment to this report.

##### b. Issues

##### b.1 Identification Threshold

In general, station personnel effectively identified issues at a low threshold and entered problems as CRs into the CAP. The licensee also encouraged the staff to use CRs to report suggested enhancements to station activities or equipment. Upon entry into the CAP, each CR received a priority classification (Priority 1 through 4) according to significance. Enhancements were addressed separately, effectively as category or

priority 5. Approximately 6,400 CRs were initiated, exclusive of enhancements since the previous NRC inspection of the problem identification and resolution programs in February, 2002.

Interviews with plant personnel indicated that some employees continued to routinely rely on their supervisors for entering items into the CAP. One concern, which was voiced by a number of interviewees, involved lack of status feedback on an issue to the individual who originally identified it. The licensee indicated that this concern would be addressed by a software enhancement under evaluation which would enable searches of the database by originator.

#### b.2 Operating Experience

The team reviewed Operating Experience (OPEX) information and reports and discussed OPEX program activities during interviews with selected personnel. The team concluded that the process appeared to be functioning well, with one minor exception:

- An OPEX report concerning shelf-life issues with radio-iodine filter cartridges (activated charcoal type) was distributed from the corporate office to station radiation protection departments but was not forwarded to the emergency planning groups, which also utilized radio-iodine filter cartridges (silver zeolite type). The oversight was not identified for several months and was discovered coincidentally during preparations for an external audit.

#### b.3 Nuclear Oversight

The team noted consistent involvement of the Braidwood Nuclear Oversight (NOS) group in the CAP process. The group identified numerous technical issues and aggressively identified adverse trends in performance across the spectrum of areas they assessed. Further, NOS had developed a high-intensity field-observation-based approach to conducting oversight during the first few days of a station refueling outage. This process was intended to promptly identify worker performance issues and, where possible, get the issues corrected on the spot. The team concluded that NOS appeared to have a positive influence in problem identification and resolution across a number of areas of station performance.

#### b.4 Selected System Review

The team performed an indepth review of the: containment spray, auxiliary building ventilation, and the station batteries/125-volt DC systems, and concluded that the licensee appropriately placed conditions adverse to quality into the CAP. More information on observations is in Section 4OA2.2b.3 of the report.

## .2 Review and Evaluation of Issues

### a. Inspection Scope

The team reviewed previous inspection reports and corrective action documents generated since February, 2002. In selected cases, documents were reviewed which reflected activities in areas of interest over the past five-year period. The team reviewed selected Apparent Cause Evaluations (ACE), Root Cause Reports (RCR), prompt investigations, operability determinations and Common Cause Analyses (CCA) to independently verify that identified issues were appropriately prioritized and evaluated when entered into the licensee's corrective action program. During this review, the team focused on the technical adequacy of the cause determinations, extent of condition reviews including evaluations of potential common cause or generic concerns, and the appropriateness of the corrective actions. In addition, the team also assessed the adequacy of the operability and reportability determinations.

The team selected several items to ensure proper implementation of the Maintenance Rule. This included verifying that the functional failures and unavailability time were properly counted and tracked.

Other attributes reviewed by the team included the quality of the licensee's trending of conditions and the corresponding corrective actions. The team searched for items or issues which looked like potential trends and assessed whether the licensee had appropriately identified and captured these trends within the corrective action program. The team also assessed licensee corrective actions stemming from previous Non-Cited Violations (NCVs) and Licensee Event Reports (LERs).

This review included the controlling procedures, selected records of activities, and observation of various licensee meetings. In addition, the team conducted several interviews with cognizant licensee personnel.

The specific documents reviewed are listed in an Attachment to this report.

### b. Issues

#### b.1 Overview of Prioritization and Evaluation Process

Condition Reports and Assignment Reports were entered into the computerized data base by any member of the Braidwood Station staff. Daily, the reports from the previous day were collected for a morning review by a committee of Departmental CAP Coordinators. The CAP coordinators reviewed the items, focusing on their respective areas of specialization. Discussions addressed appropriate actions to recommend to management, including who should be assigned to complete those actions. Reportability, repetitiveness, and trending were discussed as appropriate.

Management evaluation was essentially continuous with daily Management Review Committee (MRC) meetings which reviewed document packages accumulated since the previous meeting. This committee served to review and oversee the significance, classification, and disposition determination of CRs which may include further

assignments, and investigations such as; root cause analysis, apparent cause evaluations, or common cause analysis. In addition, the MRC ensured followup on NRC issues and the appropriateness of corrective actions.

As previously noted, the licensee utilized a graded process to prioritize CRs by perceived significance. This type of process was necessary with a large, low-threshold program so that resources were not over-invested in trivial events. The team noted that, of the approximate 6,400 events in the data base (excluding enhancements) since the last previous PI&R inspection in February 2002, only 29 events were classified as significant conditions adverse to quality for which Root Cause assessments were performed.

Inspection team members attended both CAP Coordinator and Management Review Committee meetings to observe processing of corrective action documents. The team did not identify instances of significant disagreement with the priority classification or disposition of the corrective action documents at those meetings.

## b.2 Trending

The licensee regularly performed analyses of CRs for adverse trends using the Station's Coding and Trending Manual as guidance. Although the licensee initiated 72 CRs relating to potential or actual adverse trends in performance of some activity, further evaluation showed no actual decline in performance in most cases. When genuine declines in performance were identified, the licensee initiated Apparent, Common or Root cause evaluations as appropriate to understand the adverse trend and to determine appropriate corrective actions. The team noted that since the last inspection, the licensee continued to monitor human performance and equipment performance trends. These issues were long-standing and are discussed in Section 4OA2.3.b.1.

The team independently reviewed a sample of condition reports, generated between February 2002 and September 2003, and identified one trend which was not previously identified by the licensee and two issues which were not identified by the licensee in a timely manner. These included:

- The team identified that, between February and November 2002, six failures and one out-of-tolerance for the same model pressure switch used on the diesel generators occurred. As each switch failed, it was replaced with a switch of a new model because the old one was obsolete. The team did not have an operability concern because trips initiated by the pressure switches were automatically overridden during an emergency start. However, the team noted that the licensee had not identified the multiple failures of the same model switch as an adverse trend. The team also noted that the corporate procedure EA-AA-520, "Instrument Performance Trending," Revision 3, required that instruments found out-of-tolerance be trended, but did not require failed instruments to be trended.
- Prior to May 2003, a number of chemical control issues were entered in the CAP program; however, a performance trend was not identified by the department CAP coordinator. In May 2003, after overhearing a discussion between the Site

Vice President and chemistry department personnel, the station CAP Coordinator initiated a potential trend CR. Once confirmed that repetitive problems had occurred, the licensee initiated a Functional Area Self Assessment (FASA) and implemented corrective actions including staff training. The team noted this late recognition of the trend delayed the implementation of corrective action.

- In 2002 and 2003, the licensee initiated several CRs related to exceeding monthly station radiation exposure (dose) goals. In July 2003, the licensee performed Common Cause Analysis (CCA) and identified two significant common causes, including non-inclusion of emergent work in the development of the goals and the necessity to estimate doses for many jobs before final details on job staffing and work requirements were known. The team noted that Braidwood Station cumulative doses were not high; however, earlier recognition of this issue could have contributed to achieving even lower doses.

b3. Selected Systems Evaluation of Issues for the Selected Systems

The team reviewed condition reports and work orders associated with the three systems listed below and concluded that the licensee adequately prioritized and evaluated the adverse conditions. Specifically:

- 125Vdc system. In January of 2002, the licensee included this system in the station's "Chronic Problems" program, due to a prolonged history of grounds. An assessment was performed, yielding several recommendations including collecting highly sensitive baseline data on all four trains and development of a procedure to assist operators in locating and isolating grounds. The team concluded that while chronic, the grounds had not adversely affected system availability to function. The team also noted that the procedure for locating and isolating grounds was completed September 3, 2003; however, use of this procedure was optional (a work request could be initiated instead). Despite numerous grounds on two different trains in mid-September 2003, operators were unable to use the procedure because the grounds were transient. The team concluded that the licensee appropriately evaluated the system's performance; however, the team could not assess the effectiveness of the corrective actions.
- Auxiliary building ventilation system: The licensee identified several problems with the system and noted that the system had not been operating as designed since original construction. Several effective corrective actions were implemented such as damper repairs and adjustments, and fan blade adjustments which has resulted in improved performance within the past 5 years. The team did not identify any concerns with respect to the operability or evaluation of the system.
- Containment Spray: The team conducted a detailed followup of an issue involving the determination of the correct acceptance criteria for sodium hydroxide eductor flow to use during surveillance tests. No operability concerns

with the system were identified and the team determined that the CAP process was effectively used for the CS system.

#### b.4 Focused Area Self-Assessments

Focused Area Self-Assessments (FASA) were a corrective action tool which the licensee was using in both a proactive and a reactive manner to gather information and evaluate it. On the reactive side, FASAs were regularly conducted to evaluate a perception that an adverse trend in performance had occurred or was occurring. These assessments were an important factor in segregating out any genuine declines in performance so that appropriate attention could be directed to corrective action. On the proactive side, FASAs were performed in a variety of areas in preparation for auditing or inspection at Braidwood by an outside organization, including this NRC inspection of PI&R. These assessments amounted cumulatively to a self-initiated PI&R by the licensee. They were typically performed by the CAP Coordinators. The team reviewed selected FASA reports, and some resultant CRs, and concluded the process was being effectively implemented and that the results were valuable in directing corrective action resources efficiently and effectively.

#### b.5 Scope of Evaluations

The team examined corrective action documentation and conducted interviews with station personnel with a focus on whether the licensee was addressing issues in a comprehensive manner, such that they were clearly understood, and the team verified that a broad range of options was appropriately considered when determining corrective action(s) for identified problems. The licensee's evaluations were found to be broadly-based and inclusive of diverse options, with the following exception:

- During the April 2003 refueling outage (A1R10), a large number and variety of radiological control problems including difficulties in control of contamination (personnel, equipment and areas), deteriorating rad-worker practices, and ineffective use of the corrective action program by radiation protection staff were identified. The licensee initiated two Root Cause Reports to address over 90 CRs and Common Cause reviews, staff and contractor interviews, and multiple outage planning and implementation documents. The licensee determined that failed leadership by the radiation protection management was a contributing cause. However, the team noted that the licensee did not consider addressing the resource/challenge mismatches by reducing the pace or content of the outage schedule.

### .3 Effectiveness of Corrective Action

#### a. Inspection Scope

The team reviewed selected CRs and associated corrective actions to evaluate the effectiveness of corrective actions, verifying that corrective actions, commensurate with the safety significance of the issues, were identified and implemented in a timely manner, including corrective actions to address common cause or generic concerns. The team also verified the implementation of a sample of corrective actions. In addition,

the team reviewed a sample of corrective action effectiveness reviews completed by the licensee. The samples were selected based on their importance in reducing operational risks and recurring problems. The team focused on information recorded since February 2002, but selected items were reviewed going back over a 5-year period.

The team also re-examined several previously-identified findings and issues to assess the effectiveness of the corrective actions. This included a sampling of NRC-identified issues that did not become findings, previously identified NCVs, and issues from the previous PI&R inspection. The team's review of the corrective actions to address the supplemental inspection for the degraded cornerstone is addressed in Section 4OA2.4 of this report.

The licensee's CAP allowed corrective action tracking items to be closed once the work control process was initiated. Therefore, the team also reviewed the status of a number of work requests created as corrective actions for the period covered by the inspection, to ensure the work requests accurately reflected the item to be corrected and that they were not subsequently canceled or excessively postponed. In all cases, there was adequate documentation to demonstrate that corrective actions were completed, or valid justification for not performing the action(s) was provided when appropriate.

The specific documents reviewed are listed in an Attachment to this report.

b. Issues

b.1 Previously-Identified Problems

During the review, the team noted recurring problems associated with contractor control, foreign material exclusion (FME) control, and rework issues. These areas were identified as concerns in the previous NRC inspection of problem identification and resolution in February, 2002. Although the team noted some improvement in the overall trend, the licensee acknowledged the response was not as expected and planned additional corrective action to improve performance.

b.2 Corrective Actions to Address Previously-Identified Findings

The team reviewed the licensee's corrective actions associated with selected licensee event reports, previous non-cited violations, and NRC identified concerns and concluded that with one exception, the licensee's proposed actions were completed in a timely manner and that the actions appeared appropriate as evidenced by the lack of repeat problems. The inspectors observed the following:

- The corrective actions for finding 50-456/02-03-02 for failure to properly set the trip setpoint for a circuit breaker were not effective, in that, two repeat occurrences were identified with two additional findings as documented in Inspection Reports 50-456/02-05; 50-457/02-05 and 50-456/03-02; 50-457/03-02.

## b.2 Comprehensiveness

The inspection team reviewed many licensee corrective actions through to completion, to ensure the actions identified and decided upon were actually implemented. This included a number of examples where one CR was closed to the actions of another, examples where multiple CRs were encompassed under a higher-level corrective action, and examples where CRs were closed to a Work Request (WR). The team concluded that corrective actions were complete and traceable to have been implemented as planned with the following exception:

- The actions for CR #00154546, which reported on premature (immediate) failure of new parts installed into a 125V D.C. charger, included a process change to ensure future new parts would be pre-tested on site prior to installation. The inspectors identified that the licensee had not established interim corrective actions to ensure that the testing would be complete prior to the formal process change. In fact, the inspectors noted that during this inspection period, new parts had been received. Testing was conducted only because an electrical maintenance individual recalled the long term corrective actions.

## b.3 Timeliness

The licensee's CAP was intended to establish timeliness of corrective actions primarily on the basis of perceived safety significance and priority. The team determined that this process was normally functioning in an acceptable manner and achieving that objective. For issues of lower priority, the team noted that some actions were delayed, or temporary fixes were left in effect over a prolonged period. For example:

- After a few events involving elevated levels of dissolved oxygen in the Unit 1 condensate and feedwater system, caused by in-leakage at a booster pump seal, the licensee processed an Engineering Change Notice (ECN) to put in place a temporary fixture to supply a nitrogen over-pressure on the seal. Seal replacement was not promptly scheduled. Thereafter, operations personnel twice failed to replenish the nitrogen supply in a timely manner, causing two additional dissolved oxygen excursions. The seal was scheduled to be replaced in December 2003.

## b.4 Documentation

The team noted several reports of licensee-identified examples of inappropriately closed CRs. These were mostly identified by CAP Coordinators, who were performing FASA reviews preparatory to the start of this PI&R inspection. The team reviewed selected examples and found the licensee's review had been very challenging; the types of items identified as wanting in the documentation, while not literally in compliance with established expectations, were not significant. The team did not identify any additional examples of inappropriately closed CR's.

The team also noted instances of licensee-identified failures of documentation packages to contain complete, stand alone content. These were also selectively reviewed. The team found no significant issues in these examples.

#### .4 Corrective Actions for Mitigating Systems Degraded Cornerstone

##### a. Inspection Scope

As stated in Supplemental Inspection Report 50-456/02-10, the primary reason for the NRC conducting this PI&R inspection at earlier than the normal biennial frequency was to assess the mitigating systems degraded cornerstone corrective actions that were not yet complete at the time of the supplemental inspection. The team reviewed progress on all corrective actions from the licensee's degraded cornerstone root cause investigation (CR 113947) and conducted a more detailed review of 15 of those actions.

##### b. Issues

The team determined that the licensee had completed essentially all of the corrective actions identified in the degraded cornerstone root cause investigation. This included numerous action items added when new issues were identified while completing the original actions. The only exceptions to having all actions complete were some long-term effectiveness reviews. In addition, recurring actions such as the periodic Mitigating Systems Readiness Reviews were continuing. Results worthy of comment from this inspection activity were as follows:

- ATIs 113947-06 and 113947-75 dealt with developing training to improve the quality of apparent cause evaluations (ACEs) and root cause reports (RCRs) and evaluating the effectiveness of that training. Those actions were considered a success based on the team's reviews of the trends in ACE and RCR rejection rates which had both improved significantly. The team interviewed the site CAPCO and reviewed procedures and documents to determine that the standards for rejecting an ACE or RCR had not declined, which could have led to a false indication of improvement.
- ATIs 113947-16 and 113947-87 dealt with an extent of condition review to determine if Engineering Change Requests (ECRs) that were canceled, had sufficient justification for cancellation. The licensee determined that 20 out of 403 ECRs they reviewed needed more followup or documentation to justify their cancellation. The team determined that two of those followups still had documentation shortcomings. The licensee initiated CR 177534 to address and correct this NRC-identified issue. The team reviewed a list of 134 ECRs canceled in 2003 to determine if documentation had improved since completion of the licensee's corrective action. The team noted that, in general, documentation of the reason for cancellation was sufficient. However, the team identified 2 ECRs that contained no justification. The licensee determined that those 2 were ECR numbers that had been opened in error and no associated ECRs had ever actually existed. The team noted that a large number of ECRs were apparently opened in error, indicating a possible training issue.

- The team identified that ATI 113947-68 discussed opening a new ATI which was listed as ATI 113947-97. The correct new ATI number was 113947-96. The licensee initiated CR 177534 to address and correct this NRC-identified typographic error.
- ATIs 113947-30 and 113947-51 dealt with performing an initial and periodic aggregate review of risk significant systems to identify vulnerabilities to nuclear safety. The team reviewed the status of the 17 system vulnerabilities identified in the first aggregate review as part of the degraded cornerstone root cause investigation, and the first periodic review conducted in 2003. This program, conducted in accordance with engineering procedure BwVP 1700-1, "Mitigating System Readiness Review," Revision 1, appeared to be a success. Of the original 17 vulnerabilities, 10 were adequately addressed and removed from the list. However, 8 new vulnerabilities were identified in the 2003 review and added to the list. This demonstrated that the program was robust and was adding value. The team understood that the program was being?? considered for incorporation by the rest of the nuclear stations in the company.
- The team identified one concern with the licensee's action to address the vulnerabilities identified by the aggregate reviews. The hydraulic governors on the diesel generators had been identified as obsolete and difficult to repair or replace with the plant on line. Three of the four governors had been replaced with a newer model. However, the fourth governor, for the 2A diesel generator, had not been replaced and its scheduled replacement had been deferred through three consecutive refueling outages, including the upcoming one. The reason for the deferrals was stated as schedule and budget constraints. The team was concerned that the licensee gave no indication that schedule and budget issues would be any more conducive for the work in future outages. However, the team was informed that consideration was being?? given to conducting the replacement with the plant on line. There were no immediate operability concerns because the governor was performing well and the licensee had an inventory of spare parts from the three governors removed from the other diesels.

Overall, the team concluded that the licensee was taking adequate and timely corrective actions to address the issues identified in its mitigating system degraded cornerstone root cause report.

#### 4OA4 Cross Cutting Aspects of Findings

##### Safety-Conscious Work Environment

###### a. Inspection Scope

The team interviewed numerous members of the plant staff, representing several different work groups at various levels, to assess the establishment of a safety conscious work environment.

During the interviews, document reviews, and observations of activities, the team looked for evidence that plant employees might be reluctant to raise safety concerns. The interviews typically included questions similar to those listed in Appendix 1 to NRC Inspection Procedure 71152, "Suggested Questions for Use in Discussions with Licensee Individuals Concerning PI&R Issues." The team also reviewed the station's procedures related to the Employee Concerns Program, (ECP) and discussed the implementation of this program with the station's program investigator/coordinators. The team also reviewed associated procedures and several case reports to verify compliance.

###### b. Issues

No significant findings were identified. None of the plant staff members interviewed expressed concerns regarding a safety-conscious work environment. All staff members said individuals were encouraged by management to identify issues and bring them to management's attention or enter them into the CAP. For staff members who were not proficient at making CAP entries, management personnel entered the issue into CAP, or helped the staff members with the system. The team noted that the CAP program was used more than in the past and individuals were not avoiding entering issues into the CAP due to fear of being assigned actions to address them (boomerang effect) especially during heavy work loads.

When questioned about their knowledge of the ECP, all staff members said they were aware of it and could name the ECP Coordinators. Staff members did not express any significant reluctance to use the ECP and no one stated that they knew anyone who had a negative experience using the ECP. When asked if they actually knew anyone who had brought a concern to the ECP, none of the staff members interviewed could name anyone. This indicated that the confidentiality of the ECP was rigorously maintained. In addition, everyone interviewed also knew of the availability of the NRC.

#### 4OA6 Meetings

##### Exit Meeting

The team presented the inspection results to Mr. Thomas Joyce and other members of licensee management on October 15, 2003. The licensee acknowledged the findings presented. The team confirmed with the licensee that proprietary information was examined during the inspection; however, this was not specifically discussed in this report.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

M. Pacillio, Site Vice President  
T. Joyce, Plant Manager  
E. Stefan, Regulatory Assurance - NRC Coordinator  
G. Baker, Security Manager  
G. Dudek, Operations Manager  
C. Dunn, Engineering Director  
K. Root, Regulatory Assurance Manager  
C. Chovan, Work Management Director  
B. Stoffels, Maintenance Director  
F. Lentine, Design Engineering Manager  
R. Gilbert, Nuclear Oversight Manager  
J. Moser, Radiation Protection Manager

#### Nuclear Regulatory Commission

A. Stone, Chief, Reactor Projects Branch 3

### **LIST OF ITEMS OPENED, AND CLOSED**

#### Opened

None

#### Closed

None

## LIST OF DOCUMENTS REVIEWED

### Action Requests (AR) and Condition Reports (CR)

#00091032	Concerns Raised During 1A CS Test	1/17/2002
#00032363	1B CS Additive Tank Flowrate Verification Out-of-tolerance	1/25/2002
#00096132	B3 Trend Code: 1PSH-DG104B Out-of-tolerance	2/22/2002
#00096140	B3 Trend Code: 1PS-DG110B Out-of-tolerance	2/21/2002
#00096145	B3 Trend Code: 1PSH-DG100B Out-of-tolerance	2/21/2002
#00096151	B4 Trend Code: 1PSH-DG099B Out-of-tolerance Low	2/21/2002
#00096800	Configuration Control Event During Slave Relay Testing	2/26/2002
#00100618	Preconditioning of 1B Auxiliary Feedwater Diesel Engine	3/22/2002
#00112250	B3 Trend Code: 1PSH-DG101B Erratic and Required Replacement	6/18/2002
#00113947	Mitigating Systems Cornerstone Degraded - Equipment Issues	7/1/2002
#00126301	NRC Notes on Valve Lineup Missing Label and Incorrect Location	10/8/2002
#00123878	Discrepancy Between the Updated Final Safety Analysis Report and the Auxiliary Building Flood Calculation	9/20/2002
#00128631	Potential for Floor Drain Clogs (Rags Collecting Seepage)	10/23/2002
#00131269	B3 Trend Code: 2PSH-DG100A Found Out-of-tolerance	10/12/2002
#00132313	FASA - Quality of System Engineering Notebooks	11/19/2002
#00133091	Potential Vulnerability - CRs During Work Package Closeout	11/25/2002

#00138825	Gap Under Door Does Not Match Flood Calculation Assumption	1/9/2003
#00145697	NRC Question Regarding PR011J Particulate Filter Changeout	2/21/2003
#00171644	Trending of CAP Data Not Consistently Performed Across Departments	8/14/2003
#00175022	Train A CS Spray Additive Flow Rate Out of Specification High	9/9/2003
#00177534	PI&R Inspection, ATI Closure Documentation Discrepancies [NRC-Identified]	9/25/2003
164997-01	Revise BwHS TRM 3.8.c.4 See In progress Notes for Assignment Description	9/30/2003
#00115772	Potential trend in Chemistry - missed/delayed samples	7/17/2002
#00157839	Potential trend in Chemical Control issues (storage/permits)	5/8/2003
#00165485	Chemical Control FASA: Deficiencies Noted	6/30/2003
#00158929	Unsatisfactory Attendance - Chemical Control Monthly Meeting	5/15/2003
#00152162	High failure rate on rad worker portion of GET exam	4/3/2003
#00154291	Elevated Dose Rates noted during containment initial surveillance	4/16/2003
#00156006	Lack of rad protection presence/oversight during outage	4/27/2003
#00168893	Monthly Collective Radiation Exposure Exceeds Goals	7/24/2003
#00169830	Exelon Sites Monthly Exposure Goals Routinely Exceeded	7/31/2003
#00156195	Potential Trend - rad worker practices and housekeeping	4/28/2003
#00156066	Management unwilling to write CRs for fear of action items	4/28/2003
#00106704	EP PI for drill participation declining trend	5/3/2002

#00119990	EP Improvement Items for ERO Performance	8/22/2002
#00120015	EP Deficiencies Identified for ERO Performance	8/20/2002
#00123560	NOS ID'd ERO Performance Deficiencies During Pre-exercise	9/19/2002
#00161586	Silver Zeolite cartridges past vendor recommended shelf life	6/3/2003
#00162151	NOS ID'd (EP) Potential Adverse Trend EP Equipment Readiness	6/5/2003
#00167048	ERO Performance Issues from 2 <sup>nd</sup> quarter EP mini-drill	7/10/2003
#00131704	Declining Trend in Security Human Performance	11/14/2002
#00166046	Security identified areas for improvement from LLEA drill	7/2/2003
#00170879	Increased Number of Security Violations During 2 <sup>nd</sup> Qtr. 2003	8/8/2003
#00119097	Loss of FME Integrity for 111, 112, 211 and 212 ESF Batteries	8/13/2002
#00119539	Foreign Material in Battery 111 cell 24 (1/4 inch material)	8/16/2002
#00135759	Problems noted in Battery 211 Quarterly Surveillances	12/13/2002
#00165384	DC Battery 211 temperature and voltage above admin limit	6/28/2003
#00154546	Repeat Maint - Various Battery Charger 112 Maint. Problems	4/18/2003
#00155743	125 v dc Battery 112 surveillance failed - high float current	4/25/2003
#00179195	Several events in Operations warrant Common Cause Analysis	10/3/2003
#00095525	Elevated WS Strainer D/P's due to lake control issues	2/17/2002
#00129687	Mitigating Systems Review Vulnerabilities Tracking	10/31/2002

#00086970	Perform FASA On Clearance Orders in Operating Department	9/30/2003
#00108783	Procedure Adherence Identified As Common Cause For Configuration Control	5/20/2002
#00119319	Rework-2A turbo thrust bearing trip - unplanned LCO	8/14/2002
#00122579	Late Technical Specification sample - Surveillance 3.4.18.2	9/12/2002
#00141389	Manual lineup of VC in emergency mode (unplanned LCO entry)	1/27/2003
#00157367	Entry into 1BwOA PRI-4 due to High RCS Activity on 1PR06J	5/5/2003
#00166634	Elevated Unit 2 RCS Xe-133 due to a Fuel Leak	7/8/2003

#### **Plant Procedures and Audits**

LS-AA-125	Corrective Action Program (CAP) Procedure	Revision 5
LS-AA-125-1001	Root Cause Analysis Manual	Revision 3
LS-AA-125-1002	Common Cause Analysis Manual	Revision 2
LS-AA-125-1003	Apparent Cause Evaluation Manual	Revision 2
LS-AA-125-1005	Coding and Trending Manual	Revision 3
BR-40	Braidwood Station Policy Memorandum Expectations for Extending Condition Report Cause Investigations and Corrective Action Due Dates	Revision 0 May 22, 2003
BwAr 1-21-D6	125V DC BUS 111 GROUND	Revision 8
BwOP AN-5	GROUND ISOLATION FOR THE PLANT ANNUNCIATOR SYSTEM	Revision 5E2
1BwOS DC-1a	AAR *125 VDC ESF BUS GROUND	Revision 4
BwOP DC-23-212	125V DC BUS 212/214 GROUND DETECTION	Revision 0
BwVP 1700-1	Mitigating System Readiness Reviews	Revision 1
ER-AA-520	Instrument Performance Trending	Revision 3

EI-AA-101-1001	EMPLOYEE CONCERNS PROGRAM	Revision 0
EI-AA-101-1002	EMPLOYEE CONCERNS PROGRAM TRENDING TOOL	Revision 0
	ECP CONCERNS TREND SUMMARYS	2002 and 2003
	Instrument Performance Trending Report 02/2002 to 07/2002 (Report 6)	October 1, 2002
	Instrument Performance Trending Report 08/2002 to 07/2003 (Report 7)	October 2, 2003
	Focused Area Self-Assessment; Problem Identification and Resolution	August 19, 2003
	Braidwood Nuclear Oversight Biweekly Issues	August 23, 2003 through September 5, 2003
NOSA-BRW-03-01	Corrective Actions Program Audit Report NOS Audit	February 14, 2003
NOSA-BRW-03-05	NOS Engineering Design Control Audit Exit Report	August 1, 2003

#### **Completed Cause Evaluations and Reports**

RCR 154291	Elevated, Unanticipated Contamination Levels during A1R10 Due to Crud Loading on High Axial Offset Anomaly Demo. Fuel Assemblies	6/5/2003
CCAR 156195	Trend identified with Radiation Protection issues during A1R10	5/12/2003
CCAR 168893	Potential Trend in Braidwood Failure to Meet Monthly Radiation Exposure Goals	9/17/2003
RCR 164043	Failure of Radiation Protection Management and Leadership to control radworker events during A1R10 because RP fundamentals were not communicated to and enforced upon the station workforce	9/2/2003
RCR 955925	Elevated WS Strainer D/P's due to lake control issues	4/9/2002
ACIT 86970	Perform FASA on Clearance Orders in Operating Department	9/30/2003

CCA 161551	Configuration Control Events June 2002 to June 2003	6/30/2003
CCA 152418	Configuration Control Events April 2002 to April 2003	4/4/2003
CCA 143888	Configuration Control Events July 2002 to March 2003	3/10/2003
RCR 108783	Procedure Adherence Identified as a Common Cause for Configuration Control	7/26/2002
ACE 119319	Rework-2A DG turbo thrust bearing trip - Unplanned LCO	9/27/2002
RCR 122579	Late TS sample for Surveillance 3.4.18.2	10/11/2002
RCR 141389	Manual lineup of VC in emergency mode (Unplanned LCO entry)	3/17/2003
RCR 157367	Entry into 1BwOA PRI-4 due t High RCS Activity on 1PR06J	5/5/2003
RCR 166634	Elevated Unit 2 RCS Xe-133 due to a Fuel Leak	8/26/2003
ATI 164997-01	Revise BwHS TRM 3.8.c.4 See In progress Notes for Assignment Description	9/30/2003

## LIST OF ACRONYMS USED

ACE	Apparent Cause Evaluation
ATI	Action Tracking Item
CAP	Corrective Action Program
CAPCO	Corrective Action Program Coordinator
CCA	Common Cause Analysis
CR	Condition Report
CS	Containment Spray System
DRP	Division of Reactor Projects
ECP	Employee Concerns Program
ECR	Engineering Change Request
EP	Emergency Planning
FASA	Focused Area Self Assessment
FME	Foreign Material Exclusion
LER	Licensee Event Report
NCV	Non-Cited Violation
NOS	Nuclear Oversight
NRC	Nuclear Regulatory Commission
OPEX	Operating Experience
PI&R	Problem Identification and Resolution
RCR	Root Cause Report
VA	Auxiliary Building Ventilation
WR	Work Request