

June 12, 2007

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

SUBJECT: BRAIDWOOD STATION, UNITS 1 AND 2  
NRC PROBLEM IDENTIFICATION AND RESOLUTION  
INSPECTION REPORT 05000456/2007007 AND 05000457/2007007

Dear Mr. Crane:

On May 1, 2007, the U.S. Nuclear Regulatory Commission (NRC) completed a team inspection of problem identification and resolution at your Braidwood Station, Units 1 and 2. The enclosed inspection report documents the inspection findings which were discussed on March 30, 2007, Mr. M. Smith and other members of your staff, and subsequently on May 1, 2007, with Mr. D. Ambler and other members of your staff.

This inspection was an examination of activities conducted under your license as they relate to the identification and resolution of problems, 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.

On the basis of the sample selected for review, the team concluded that, in general, problems were properly identified, evaluated, and corrected. However, the inspectors identified two findings during the inspection. One finding of very low safety significance (Green) was identified for the licensee's failure to perform an adequate extent of condition review for safety related valves that had not been included in and tested in accordance with the inservice test program. The second finding involved the licensee's failure to maintain an adequate operations procedure that had the potential to secure the only remaining residual heat removal pump while in the recirculation mode of operation. Both findings were violations of NRC requirements. However, because each finding was of very low safety significance and because the findings were entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs), in accordance with Section VI.A.1 of the NRC's Enforcement Policy.

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

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Richard A. Skokowski, Chief  
Branch 3  
Division of Reactor Projects

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

Enclosure: Inspection Report No. 05000456/2007007 and 05000457/2007007  
w/Attachment: Supplemental Information

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

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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  
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Letter to Christopher M. Crane from Richard A. Skokowski dated June 12, 2007

SUBJECT: BRAIDWOOD STATION, UNITS 1 AND 2  
NRC PROBLEM IDENTIFICATION AND RESOLUTION  
INSPECTION REPORT 05000456/2007007; 05000457/2007007

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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: 05000456/2007007 and 05000457/2007007

Licensee: Exelon Nuclear

Facility: Braidwood Station, Units 1 and 2

Location: Braceville, Illinois

Dates: March 12 through May 1, 2007

Inspectors: D. Smith, Project Engineer - Team Lead  
N. Valos, Senior Operations Engineer  
D. Jones, Reactor Engineer  
M. Perry, Illinois Emergency Management Agency

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

Enclosure

## SUMMARY OF FINDINGS

IR05000456/2007007, 05000457/2007007; 03/12/2007 - 05/01/2007; Braidwood Station, Units 1 and 2. Identification and Resolution of Problems.

This report covers an approximate 16 week period of inspection by a project engineer, two regional specialists, and an Illinois Emergency Management Agency inspector. Two Green findings, which were both Non-cited violations, were identified by the inspectors. 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.

### Identification and Resolution of Problems

In summary, the inspectors determined that the station's corrective action program was effectively implemented as evidenced by the identification of plant issues through various methods including departmental assessments and nuclear oversight audits. Plant issues were documented in the station's corrective action program in a timely manner, and the licensee generally implemented effective corrective actions to address plant issues and events. The station has been effectively utilizing operating experience to prevent events and improve performance at the station. However, an example of an inadequately performed extent of condition review resulted in a Non-Cited violation during this inspection. A similar problem with the licensee's extent of condition reviews was also identified during the October 2005 Problem Identification and Resolution Inspection.

The presence of a challenging nuclear oversight organization was apparent at the station. This organization as well as other internal and external groups, have noted continuing deficiencies in supervisory oversight. This issue with supervisory oversight was evident in the licensee's ability to sustain improved performance in several struggling areas, such as, the control of transient combustibles, maintenance of personnel qualifications, and events related to the bumping of plant equipment. The inspectors noted good communications of and execution of the station's employee concern program. Additionally, the results from interviews, conducted by the inspectors, reflected a safety conscious work environment at the station.

### A. NRC-Identified and Self-Revealing Findings

#### Cornerstone: Mitigating Systems

- Green. The inspectors identified a violation of Technical Specification 5.4.1, "Procedures," for the licensee's failure to provide an adequate procedure to ensure the continued operation of the "A" residual heat removal pump, during cold leg recirculation mode of operation, during conditions when the "B" residual heat removal pump was not available. The licensee initiated an issue report to

track the resolution of this finding. Subsequently, the licensee revised the affected procedure on May 21, 2007 to ensure one residual heat removal pump remained operable.

The licensee's failure to maintain an adequate procedure to ensure the continued operation of the "A" residual heat removal pump was more than minor because the finding affected the mitigating systems cornerstone objective of ensuring the availability and reliability of the emergency core cooling system to respond to initiating events to prevent undesirable consequences. Specifically, the finding was associated with the mitigating systems attribute of procedure quality. The finding is of very low safety significance because the finding screened as Green during the Phase 1 Significance Determination Process. (Section 4OA2.a.1)

- Green. The inspectors identified a Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," because the licensee failed to include several manual component cooling water system valves, that were required to perform a safety function, in the inservice testing (IST) program and subsequently test the valves in accordance with IST program requirements. The finding was related to the cross-cutting area of Problem Identification and Resolution. A cross-cutting aspect in the corrective action program was identified because the licensee did not conduct an adequate extent of condition review, for a previously missed IST surveillance on several essential service water system valves. As a result, the licensee failed to identify that the component cooling water systems valves required inclusion in and testing by the IST program. The licensee initiated an issue report to track the corrective actions for this finding. Subsequently, the licensee placed the valves on the Plan-Of-The-Day Meeting Agenda to ensure testing, which was scheduled for June 30, 2007.

The failure to account for these valves in the IST program was more than minor because the finding affected the mitigating systems cornerstone objective of ensuring the availability and reliability of the component cooling water and residual heat removal systems when required to respond to initiating events to prevent undesirable consequences. Specifically, the finding was associated with the mitigating systems attribute of equipment performance. The finding is of very low safety significance because the finding screened as Green during the Phase 1 Significance Determination Process. (Section 4OA2.a.2)

**B. Licensee-Identified Violations**

None.

## REPORT DETAILS

### 4OA2 Problem Identification and Resolution (PI&R) (71152B)

#### a. Assessment of the Corrective Action (CA) program

##### (1) Inspection Scope

The inspector reviewed the licensee's CA program implementing procedures and attended CA program meetings to assess the implementation of the CA program by site personnel.

The inspectors reviewed risk and safety significant issues in the licensee's CA program since the last NRC PI&R inspection in October 2005. The selection of issues ensured an adequate review of issues across NRC cornerstones. The inspectors used issues identified through NRC generic communications, department self assessment, nuclear oversight audits, operating experience reports, and NRC documented findings as sources to select issues. Additionally, the inspectors reviewed issue reports generated as a result of station personnel's performance in daily plant activities. In addition, the inspectors reviewed Issue Reports (IRs) and a selection of completed investigation from the licensee's various investigation methods, which included root cause, apparent cause, equipment apparent cause, common cause, and quick human performance investigations.

The inspectors selected four high risk systems, which included the emergency diesel generator, circulating water, pressurizer, essential service water systems, to review in detail. The inspectors' review was to determine whether the licensee was properly monitoring and evaluating the performance of these systems through effective implementation of station monitoring programs. A five year review on the pressure boundary, and essential service water systems was also undertaken to assess the licensee's efforts in monitoring for system degradation due to aging aspects. The inspectors also performed partial system walkdowns of all the systems except for the pressure boundary system due to the system's inaccessibility.

During the reviews, the inspectors determined whether the licensee's actions were in compliance with the station's corrective action program and 10 CFR 50, Appendix B requirements. Specifically, the inspectors determined if station personnel was identifying plant issues at the proper threshold, entering the plant issues into the station's CA program in a timely manner, and assigning the appropriate prioritization for resolution of the issues. The inspectors also determined whether the licensee assigned the appropriate investigation method to ensure the proper determination of root, apparent, and contributing causes. The inspectors also evaluated the timeliness and effectiveness of corrective actions for selected IRs, completed investigations, and NRC findings including non-cited violations.

This inspection constitutes one biennial sample of problem identification and resolution as defined by Inspection Procedure 71152.

(2) Assessment

.1 Identification of Issues

The licensee's effectiveness in implementing the station's CA program was evidenced by the engagement of station personnel, from all departments, in generating issue reports, documentation of findings by both internal and external groups, number of self-identified trends, and results from the station's 2007 PI&R Focused Area Self Assessment (FASA). Generally, department assessments and nuclear oversight audits properly characterized issues as deficiencies when the requirements of a CA program element were not met. Concurrently, documented issues, meeting CA program element requirements, were appropriately specified as recommendations to further improve station performance. However, the inspectors did note one instance where a Nuclear Oversight (NOS) audit mischaracterized the corrective action to revise a plant support procedure, to improve its quality, as a recommendation. The audit's characterization should have been specified as a deficiency because the procedure could not be performed as written. This inadequate procedure was not a violation of NRC requirements.

Based on the wide range of plant deficiencies and enhancements noted in IRs, the inspectors determined that station personnel utilized the appropriate threshold level for entering plant issues in the CA program. Additionally, maintenance rule, system health, surveillance, and boric acid station program owners were appropriately generating issue reports when program requirements were not met or upon the identification of adverse trends. During the inspectors reviewed control room logs from March 16 through March 19, 2007, they noted, as did the site's PI&R FASA, that the control room operators had not consistently generated IRs from documented operational issues or equipment failures described in the logs. The licensee issued Operations Memo 1-07, in January 2006, describing that such log entries warranted an issue report. In addition, there were a few instances where the licensee did not generate timely issue reports based on the inspectors observations. For example, a radiation area warning gate was found blocking a painted warning sign on the floor warning personnel that radio use in the area was prohibited. The licensee's failure to ensure warning signs were not blocked was considered minor as there were no adverse safety consequences as a result of this failure. The gate was moved but the licensee did not generate an issue report until several requests were made by the inspectors. Although the licensee's had not fully implemented the corrective actions from the PI&R FASA deficiency, the inspectors considered the licensee's progress slow to ensure IRs were consistently generated.

The inspectors determined that the station implemented effective corrective actions to address the causes of maintenance department personnel's lack of involvement in writing issue reports; this issue was identified during the 2005 NRC PI&R Inspection (05000456/2005012; 05000457/2005012). The CA Program Manager conducted presentations on the IR initiation process to ensure the maintenance staff understood the process and computers were located in the maintenance shop for ease of access. The results from the partial system walkdowns, conducted by the inspectors, indicated that systems were well maintained and that identified deficiencies, such as oil and water leaks, were entered into the CA program. During the walkdown, the inspectors did

identify a couple of deficiencies that had not been entered into the CA program, however these deficiencies were minor in nature and did not adversely impact system operability.

### Findings and Observations

#### Inadequate Procedure to Ensure the Continued Operation of the "A" Residual Heat Removal (RHR) Pump While in the Cold Leg Recirculation Mode of Operation

Introduction: The inspectors identified a finding of very low safety significance and associated Non Cited Violation (NCV) of Technical Specification 5.4.1, "Procedures," for the licensee's failure to provide an adequate procedure to ensure the continued operation of the "A" RHR Pump, while in the cold leg recirculation mode of operation, when the "B" RHR Pump was not available.

Description: On March 22, 2007, the inspectors identified that Braidwood Normal Operating System Procedure, BwOP CC-8, "Isolation of CC Between Units 1 and 2," Revision 18, was inadequate. This procedure was used to support actions in the Braidwood Emergency Operating Procedures (EOP), 1BwEP ES-1.3, "Transfer to Cold Leg Recirculation Unit 1," Revision 104, and 2BwEP ES-1.3, "Transfer to Cold Leg Recirculation Unit 2," Revision 104. The inspectors concluded that procedure BwOP CC-8 was inadequate because the procedure would not ensure continued operation of the safety injection and the centrifugal charging pumps when the "B" RHR pump was not available.

Specifically, operators would use Procedure BwOP CC-8 for an event that required the transfer of the emergency core cooling system to the recirculation mode due to low-low refueling water storage tank level. Each unit specific EOP (1BwEP ES-1.3 and 2BwEP ES-1.3) specified the actions to complete the transfer to the recirculation mode. Once in the recirculation mode, the centrifugal charging pumps and the safety injection pump pumps were started using steps 1 through 6 of either EOP. Step 10.c, of each EOP, specified aligning component cooling water system for post-loss of cooling accident recovery using BwOP CC-14, "Post Loss of Cooling Accident [LOCA] Alignment of the Component Cooling [CC] System," Revision 14. Procedure BwOP CC-14 required the use of BwOP CC-8, "Isolation of Component Cooling [CC] Between Units 1 and 2," for completing this task.

Procedure BwOP CC-8 was used to separate Unit 1 component cooling water system flow from Unit 2 CCW flow during both normal and accident conditions. Therefore, if the common (CC) heat exchanger was initially aligned to the unit experiencing a LOCA, the operators were directed to secure the "A" RHR pumps. Steps to secure the pump were specified by BwOP CC-8, Step F.1.c.6 for Unit 1 and Step F.2.c.7 for Unit 2, while the RHR pumps were providing the water source supply to the safety injection and centrifugal charging pumps (Piggyback Mode). The pump would be secured based on the execution of either step, while manipulating several component cooling system valves, during the time to align the common CC heat exchanger to the unit with the LOCA. As a result of securing the only running residual heat removal pump BwOP CC-8, while in the "piggy back" mode of operation, irreversible pump damage could occur to the safety injection and both centrifugal charging pumps.

Upon the identification of this issue by the inspectors, the licensee initiated IR 00611024 to track this finding for resolution.

Analysis: The inspectors determined that the failure to provide an adequate procedure to ensure the continued operation of the "A" residual heat removal pump, while in the cold leg recirculation mode of operation, when the "B" RHR Pump was not available was a performance deficiency warranting a significance evaluation. The inspectors reviewed this issue against the guidance contained in Appendix B, "Issue Dispositioning Screening," of Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports." The inspectors determined that the finding was more than minor in accordance with IMC 0612, Appendix B, "Issue Disposition Screening," because the finding affected the mitigating systems cornerstone objective of ensuring the availability and reliability of the ECCS to respond to initiating events to prevent undesirable consequences. Specifically, the finding was associated with the mitigating systems attribute of procedure quality.

The inspectors evaluated the finding using IMC 0609, "Significance Determination Process," Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," Attachment 1, dated March 23, 2007. The inspectors answered "No" to all five questions under the Mitigating System Cornerstone column of Attachment 1. The finding was not a design or qualification deficiency confirmed not to result in loss of function per Generic Letter 91-18; did not represent a loss of system safety function; did not represent an actual loss of safety function of a single train for greater than its Technical Specification allowed outage time; did not represent an actual loss of safety function of one or more non-Technical Specification trains of equipment designated as risk-significant per 10 CFR 50.65 for greater than 24 hours; did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

Also, the finding did not affect the safety function of the high pressure recirculation system unless one train of the residual heat removal system was initially failed or unavailable due to maintenance. The unavailability of one safety system train was inherently accounted for in the SDP. Therefore, when the operators would have secured the residual heat removal pump per procedure, the loss of this train would have been accounted for in the SDP. In addition, the regional Senior Reactor Analyst (SRA) performed a confirmatory analysis to assess the risk of the finding using the site-specific Braidwood Standardized Plant Analysis Risk Model, Revision 3.21. The SRA assumed that if one train of residual heat removal system was unavailable that the high pressure recirculation function would be failed because of the inadequate procedure. Using this assumption, the SRA determined that the change in core damage frequency due to the finding was less than 1.0E-6/yr, which was considered to be of very low safety significance (Green).

Enforcement: Technical Specification 5.4.1, "Procedures," required, in part, that written procedures be established, implemented, and maintained covering the emergency operating procedures (EOPs) required to implement the requirements of NUREG-0737, "Clarification of TMI Action Plan Requirements," and NUREG-0737, Supplement 1. Item I.C.1 of NUREG-0737 and NUREG-0737, Supplement 1, Section 7, required, in part, the development of EOPs to cover transients and accidents including

an event that required transfer of the emergency core cooling system to the cold leg recirculation mode of operation.

Contrary to this requirement, on March 22, 2007, the inspectors discovered that Braidwood Normal Operating Procedure, BwOP CC-8, "Isolation of CC Between Units 1 and 2," Revision 18, was inadequate. This procedure was used to support actions in each unit specific Emergency Operating Procedure, 1BwEP ES-1.3, "Transfer to Cold Leg Recirculation Unit 1" Revision 104, and 2BwEP ES-1.3, "Transfer to Cold Leg Recirculation Unit 2," Revision 104. A procedural step failed to ensure the continued operation of the safety injection and centrifugal charging pumps, while in the cold leg recirculation mode of operation, when the "B" residual heat removal system pump was not available. The licensee generated an issue report to followed up on the corrective actions for this finding. Subsequently, the licensee revised BwOP CC-8 on May 21, 2007, to ensure a RHR pump remained operable.

Because the finding is of very low safety significance and it was entered into the licensee's corrective action program (IR Number 00610994), the finding is being treated as a NCV consistent with Section VI.A.1 of the NRC Enforcement Policy. **(05000455/2007007-01;05000456/2007007-01)**

## .2 Prioritization and Evaluation of Issues

The inspectors concluded that the licensee had properly prioritized issues based on the safety significance of issues, and that issues were generally well evaluated. The inspectors did not identify any issue reports that were not properly prioritized. In addition, the inspectors observed several station ownership committee (SOC) and management review board committee (MRC) meetings, and concluded that both committees generally ensured the proper prioritization and appropriate investigation assignments for plant issues. However, the inspectors did note several instances where the oversight provided by both committees was not thorough. The site's 2007 PI&R FASA documented issue with the performance of the MRC. The inspectors observed that the licensee had initiated the appropriate subsequent actions to evaluate adverse trends. Due to the effective trending at the station, the inspectors did not identify any adverse trends that had not been previously captured in the CA program through department self-identification, NOS activities, quarterly nuclear safety review board site visits, and the efforts of the site's PI&R FASA team.

The inspectors determined that the licensee's selection of investigation methods, in addressing site issues in all areas of plant operations, was appropriate and commensurate with the safety significance of the issue or event. Also, the inspectors determined that during extent of condition reviews, for plant issues, the licensee's reviews were generally adequate. However, this inspection as well as October 2005 NRC PI&R inspection identified shortcomings in the licensee's extent of condition reviews. The 2005 PI&R documented that a root cause evaluation, which was associated with the precipitation of calcium carbonate in the ultimate heat sink (IR199206), was too narrowly focused and failed to identified all the potentially affected equipment. During this inspection, the licensee was again too narrow in umbrelling the

potentially affected components. In this case, the licensee's extent of condition review failed to identify that several component cooling water valves had not been included in and tested in accordance with the requirement of the inservice testing (IST) program.

Regarding the licensee's review of equipment operability, the inspectors determined, that in general, they were appropriate with some shortcomings noted. The site's PI&R FASA as well as the inspectors identified that some operability evaluations did not discuss the affect on system operability for component failures identified when the system was not required to be operable. An example noted by the inspectors, where the operability basis was lacking, involved issue report Number 552355, "Relief valve removed from 2SI8848 failed final seat leakage." The evaluation only documented that an active leak was noted last cycle when the relief valve was installed. However, the evaluation did not discuss how the system would have been affected if the valve had lifted and subsequently experienced excessive seat leakage. Additionally, the residents had been identifying similar examples during inspections and discussed these issues at prior exit meetings with the licensee. The licensee generated IRs as a result of their own FASA, the NRC PI&R inspection, and concerns from the resident inspectors in this area.

Both the site's 2007 PI&R FASA and the inspectors, noted a few isolated instances, where the licensee's performance did not meet the requirements of several of these CA program elements. The issues identified by the inspectors are documented below.

#### Findings and Observations

#### **Component Cooling Water (CCW) System Valves not Included in the IST Program**

Introduction: The inspectors identified a Green finding involving a Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," for the licensee's failure to test several manual component cooling water system valves, that required manipulation to support the station's safety analysis, as specified by the inservice testing program.

Description: On March 18, 2007, the inspectors assessed the licensee's extent of condition review that had been performed for Inspection Report (IR) Number 00522178. The IR was associated with the licensee's failure to include certain essential service water system valves in the IST program; the licensee completed an apparent cause evaluation for this issue on August 21, 2006. In assessing the quality of the extent of condition review, the inspectors identified that certain manual CCW valves, which required manipulation during the transfer of the emergency core cooling system to the recirculation mode, were not included in and tested by the IST program.

Section 4.4.3, "Manual Valves," of NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants," Revision 1, January 2005, specified that manual valves credited in the licensee's safety analysis to perform a specific safety function in shutting down the reactor to a safe shutdown condition, maintaining the safe shutdown condition, or mitigating the consequences of an accident be included in the IST program. The inspectors identified that Braidwood Emergency Operating Procedures, for both units, 1BwEP ES-1.3, "Transfer to Cold Leg Recirculation Unit 1,"

Revision 104, and 2BwEP ES-1.3, "Transfer to Cold Leg Recirculation Unit 2," Revision 104, specified eight manual CCW system valves in each procedure. Operators were required to manipulate these valves, to meet the safety analysis CC W water flow of 5000 gallons per minute (gpm) for the residual heat removal heat exchangers, after an accident. Therefore, these CCW valves required testing in accordance with the IST program; however, the licensee did not test the valves because the valves were not included in the program. The licensee's corrective action for this issue included generating issue report Number 00610994 and placing the valves, at least 16 valves between both units, on the Plan-Of-The-Day Meeting Agenda to ensure the testing which, was scheduled for June 30, 2007.

Analysis: The inspectors concluded that the licensee's failure to include the component cooling water system valves in the IST program and subsequently test the valves per IST program requirements was a performance deficiency warranting a significance evaluation. The inspectors reviewed this finding against the guidance contained in Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Dispositioning Screening," dated November 2, 2006. The inspectors determined that the licensee's failure to test the component cooling water system valves in accordance with the IST program was more than minor because the finding affected the mitigating systems cornerstone objective of ensuring the availability and reliability of the component cooling and residual heat removal systems. Specifically, the finding was associated with the mitigating systems attribute of equipment performance.

The inspectors evaluated the finding using Inspection Manual Chapter 0609, "Significance Determination Process," Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," Attachment 1, dated March 23, 2007. The inspectors answered "No" to all five questions under the Mitigating System Cornerstone column of Attachment 1. The finding was not a design or qualification deficiency confirmed not to result in loss of function per Generic Letter 91-18; did not represent a loss of system safety function; did not represent an actual loss of safety function of a single train for greater than its Technical Specification allowed outage time; did not represent an actual loss of safety function of one or more non-Technical Specification trains of equipment designated as risk-significant per 10 CFR 50.65 for greater than 24 hours; did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. Therefore, the issue screened as having very low safety significance (Green). The finding was related to the cross-cutting area of Problem Identification and Resolution and had the cross-cutting aspect of corrective action because during the extent of condition review for IR Number 00522178, the licensee failed to identify that at least 16 CCW system valves required inclusion in and testing by the IST program.

Enforcement: Part 50 of 10 CFR, Appendix B, Criterion XI, "Test Control," states, in part, that a test program shall be established to assure that all testing required to demonstrate that safety-related structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures.

Contrary to this, on August 21, 2006, the licensee's test program failed to ensure testing of at least 16 safety-related component cooling water system valves, to demonstrate that the valves would perform satisfactorily in service. This was due to an inadvertent omission of these valves in the inservice test program. The licensee's corrective action for this issue included generating an issue report and placing the valves on the plan-of-the-day meeting agenda to ensure testing of the valves.

Because the finding is of the very low safety significance and it was entered into the licensee's corrective action program (IR 00610994), the finding is being treated as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy. (NCV 05000455/2007007-02; 05000456/2007007-02)

### **LACK OF THOROUGHNESS BY THE MANAGEMENT REVIEW COMMITTEE**

(1) **IR Number 00496552 and IR Number 00507945, 1B First Stage Reheater Drain Tank Hi-2 Alarm Failed to Reset During Reheater Valve/Intercept Valve Surveillance**

On June 1, 2005, IR Number 00496552 was written to identify a reactor power excursion to 100.4 percent during the performance of Braidwood Operations Surveillance Procedure, 1BwOS Technical Requirement Manual [TRM] 3.3.g.3, "Unit 1 Turbine Overspeed Protection Systems Valve Stem Freedom Check (RV-IV Cycling)." The power excursion occurred because the 1B First Stage Reheater Drain Tank Hi-2 level alarm failed to reset, during the performance of the monthly surveillance. When this failure occurred, increased steam flow was routed to the condenser as a result of the emergency level control valve opening to the condenser.

On July 10, 2005, IR Number 00507945 documented the occurrence of another reactor power excursion event. The power excursion was due to the same cause, failure of the 1B First Stage Reheater Drain Tank Hi-2 level alarm to reset during the performance of the surveillance, as the June 2005 event. During the second power excursion event, reactor power rose to 100.36 percent.

In response to these two events, the licensee closed the first event (IR Number 00496552) to work order 900832 to repair and calibrate the Hi-2 level switch during the next refueling outage (A1R13). Also, the licensee performed a Quick Human Performance Investigation for the second event (IR Number 00507945) and identified that both the station ownership committee and the management review committee failed to realize that the first event was a reactivity management event. The inspectors' review also determined that the Quick Human Performance Investigation failed to identify that the station ownership committee and the management review committee did not identify the need for timely interim correction action following the first event. Therefore, appropriate actions were not taken, but could have been taken to prevent the July 2005 power excursion event. The failure to take corrective actions to prevent recurrence in this case was not required by NRC regulations, so no violation occurred.

(2) **Delayed Removal of Transient Combustibles**

The inspectors attended the management review committee meeting on March 13, 2007. Issue report Number 601183, "Transient combustibles stored at lake screen house without required permit," was reviewed by the committee members. The issue report documented that the fire marshall was contacted for this issue on March 6, 2007, and indicated that the quantify of transient combustibles may be considered minor and that a permit may be required per OP-AA-201-009, "Control of Transient Combustible Materials," Revision 5.

The IR further documented that the transient combustibles would be removed the following date. The inspectors were particularly concerned with the disposition of this issue report due to recent and repeat transient combustibles problems experienced at the station (see Section 4OA2.a.3 of this report). The inspectors were concerned because the issue report did not document whether the quantity of material was actually minor, a permit was required and had been initiated to allow storage of the combustible, or other interim compensatory measures had been established to allow the transient combustibles to remain at the location.

During followup discussions with the licensee, the inspectors were informed that significant followup discussions had taken place at the plan-of-the-day meeting for this issue. The discussions indicated that the quantity of material was exempt from procedural requirements; therefore, the licensee was in compliance with the requirements of OP-AA-201-009. The inspectors were satisfied that the licensee had appropriately recognized and assessed this issue, but, the inspectors were concerned that the followup information was not subsequently captured in the issue report. The omission of this information resulted in the inability, of an independent review, to reach the same conclusion as the MRC because of the missing information.

(3) **Supervisor not held Accountability for Inadequate Radiological Briefing**

The inspectors reviewed issue report Number 499359 which involved a worker receiving an unexpected dose rate alarm. The inspectors' review of the issue report revealed that the duty supervisor was aware that the worker's alarm may alarm while performing a resin sluice evolution. However, the issue report did not document that the duty supervisor involved with the briefing was held accountable for conducting an inadequate briefing. The licensee's failure to address the specific performance of the supervisor was considered minor violation since all radiation protection personnel was briefed on the issue. The licensee's corrective actions for this event was to brief all radiation protection staff on this issue and the potential of a dose alarm for sluice activities.

(4) **Cover Contamination Should have been Identified**

The inspectors reviewed issue report Number 497545 which was associated with a contamination event. The inspectors questioned the radiation protection manager on why the contamination which had been discovered on the underside

cover plug on June 6, 2006, was not previously identified as a result of radiation surveys. The radiation protection manager informed the inspectors that this issue was a human performance issue. The licensee's failure to have previously identified the contamination was considered minor as the spread of contamination was limited.

### **New Issue Report not Written for Expanded Scope of Deficient Supervisory Performance In the Closure of Corrective Action Assignments**

In IR Number 584820, the licensee documented that supervisory performance with respect to corrective actions to prevent recurrence (CAPR) closure did not meet procedural requirements. The licensee subsequently identified, through an extent of condition review (EOC), that supervisory performance was not only deficient for CAPR closure but also for other CA assignments closures that were, associated with EACEs, CCA. The supervisors had also failed to provide electronic approval for these types of CA assignment prior to the closure. Although this new expanded deficiency of supervisory performance was part of the EOC review, this information was captured in IR Number 584820. But, this IR was limited to the inadequate closure of CAPRs assignments only.

The inspectors determined that the new information identified by the licensee during the EOC review indicated that the deficient aspect of supervisory oversight was of a larger magnitude than previously identified and documented in the 2007 PI&R FASA. Therefore, it would have been prudent for the licensee to have generated a new issue report at the time it was identified. However, the licensee later recognized this issue as a missed opportunity during the FASA and then the issue was captured in the CA program. Corrective actions taken by the licensee included rerouting the CAPR to the department managers for electronic approval. With respect to the other CA assignment types, the licensee determined that department managers had approved all of the investigation type assignments, therefore, the licensee determined not to obtain the electronic approval for these assignments. Additionally, the licensee implemented interim corrective actions to address these issues by inserting electronic route lists for all open investigations, CAPR assignments, and EFR assignments through March 31, 2007.

### **.3 Effectiveness of Corrective Action**

The inspectors concluded that the licensee generally implemented corrective actions that were effective in addressing plant issues. The licensee's 2007 PI&R FASA documented, isolated cases, where the requirements of this CA element were not met. The licensee initiated issue reports for the specific PI&R FASA deficiencies. The inspectors also noted minor examples where deficiencies were noted in this CA element.

In general, the inspectors determined that the licensee had been identifying and implementing corrective actions to arrest deficient plant performance. Specifically, in January 2007, the licensee conducted a common cause analysis (CCA), IR540986, as a result of an adverse trend in human performance errors

which had resulted in a number of station clock resets. The CCA identified two common causes: 1) individuals were failing to detect and prevent human errors through the use of basic human performance and technical human performance error reduction tools; and 2) Management, including field supervision, was failing to properly engage workers in the use of human performance and technical human performance error reduction tools. The licensee developed a number of corrective actions, some of which had been completed, which appeared appropriate to address the common causes identified in the CCA.

Additionally, NOS and the nuclear safety review board noted that supervisory oversight had been less than adequate in many instances. The licensee has recognized that challenges, in a number of areas such as out-of-service errors, qualification of site personnel, contractor injuries, control of transient combustibles, and repetitive consequential bumping events. Specifically, corrective actions associated with inadequate control of combustible materials resulted in several repeat events. Ineffective corrective actions for a root cause report in 2003 led to the NRC identification, in June 2006, of an NCV for the failure to implement the licensee's procedure for control of combustible materials. In February of 2007, the licensee again found that the root cause evaluation initiated in 2006 was not timely and that interim actions were ineffective at sustaining performance. Several mispositioning events have occurred, during the last five years, due to plant personnel inadvertently bumping plant equipment. These bumping incidents have affected safety or Technical Specification systems and directly or indirectly caused unanticipated power changes. The licensee has not characterized any of the events as a significant condition adverse to quality; therefore, the licensee did not have to prevent the occurrence of the events. In each event, the corrective actions were either narrowly focused only on the particular system or limited to easily accessible valves. An example of the licensee's narrow corrective action involved the mispositioning of a valve, on the day tank, for the 1B emergency diesel generator system. The licensee had previously decided against altering this valve, to address an earlier bumping event, on the basis that the valve's location would prevent inadvertent bumping on the valve. However, the licensee subsequently removed the valve's handle as corrective actions to this March event. Although the licensee has implemented corrective actions to improve performance in these struggling areas, the inspectors were concerned with the station's ability to sustain performance in these areas.

#### Findings and Observations

##### **Inadequate Response to the PI&R FASA Finding**

The site's 2007 PI&R FASA documented that a corrective action assignment from a root cause report was closed to a management assignment request MREQ. These types of management assignments were not used as a corrective action assignment type. The MREQ assignment action was to perform a walkdown, in the plant, to identify equipment that may be susceptible to bumping or other inadvertent manipulations. The inspectors reviewed the licensee's response to the documented FASA deficiency and concluded that the response

was inadequate because the licensee's response specified that the use of an MREQ assignment was acceptable because another CA assignment (IR526093-59) was tracking the same MREQ assignment actions. Although, the licensee's response was not consistent with CA program requirements, the failure to use the proper tracking assignment was considered minor since the issue was captured in the CA program.

### **Inadequate Corrective Actions**

The site's 2007 PI&R FASA documented that individuals (direct report to managers) and managers did not properly close corrective action to prevent recurrence (CAPRs) assignments. A supervisory review, was required by procedure, prior to the supervisor's direct reports closing the CAPRs. Although the direct reports were to send their supervisors or managers the electronic CAPR for approval, the supervisors failed to ensure the receipt of the electronic CAPR. The inspectors concluded that the supervisors' failure to implement this procedural requirement was not addressed by the licensee. Specifically, the licensee's corrective action included documenting a Fundamental Management Systems entry for the individuals, but the supervisors or managers did not receive any Fundamental Management System entries. The inspectors considered this corrective action narrowly focused and partially ineffective. The inspectors determined that these corrective actions did not ensure that supervisors and managers were held to the same level of accountability as their direct reports even though both parties were responsible for the proper closure of the CAPRs. Subsequently, the licensee made Fundamental Management System entries for the supervisors.

### **Inappropriate Corrective Action Assignment**

The inspectors reviewed two issues where the licensee assigned corrective actions that did not appear appropriate. Specifically, cases where issues should have been assigned as CA assignments, but were instead assigned as action tracking item (ACIT). The ACIT assignments, as specified by procedural guidance, track the completion of general actions required to address non-quality related issues. Two examples of CAs for quality-related issues being tracked as ACITs were noted. One issue was associated with the potential to adversely impact safety related equipment, and the second issue could have resulted in not meeting radiological posting requirements or labeling requirements, which are necessary to inform workers of radiological hazards. The licensee's failure to use the proper CA program tracking assignment for these two issues were considered minor because there were no adverse safety impacts as a result of the use of the incorrect CA program assignment.

In the first case, the inspectors reviewed an item associated with a station worker inappropriately modifying the plant that had the potential to render safety related equipment inoperable. The licensee immediately removed the unauthorized modification and determined that the modification did not adversely affect the equipment while the unauthorized alteration was in place. The licensee initiated appropriate corrective actions that entailed revising material utilized by the

worker and other in the same department. This material would be referenced in the future when considering modifications to the plant. Also, the issue was tailgated to the affected departments.

In the second case, the inspectors reviewed IR Number 499656 which was associated with a NOS finding. The IR documented that NOS identified several deficient radiological ropes, posting, and radioactive material labels. The RP Manager generated an IR to understand why the issue had not been classified as a CA assignment. The IR further documented that preventive maintenance task, which was to have identified these types of issues, was inconsistently implemented by radiation protection personnel. The corrective action specified, was to ensure the preventive maintenance task addressed these issues and address problems with label and rope degradation.

**b. Assessment of the Use of Operating Experience (OE)**

**(1) Inspection Scope**

The inspectors reviewed the licensee's implementation of the station operating experience program. Specifically, the inspectors reviewed implementing operating experience program procedures, attended CA program meetings to observe the use of OE information, completed evaluations of OE issues and events, and selected 2006 and 2007 monthly assessments of the OE composite performance indicators. The inspectors' review would determine whether the licensee was effectively integrating OE experience in the performance of daily activities, evaluations of issues were proper and conducted by qualified personnel, prevention of industry events, and use of departmental assessments and NOS audits. The inspectors also assessed if corrective actions, as a result of OE experience, were identified and effectively and timely implemented.

**(2) Assessment**

The inspectors did not identify any findings of significance in this area. The inspectors' review of operating experience reports identified that the licensee was appropriately including the issues into the CA program and effectively implementing operating experience at the station. During licensee staff interviews, the inspectors identified that the use operating experience was considered during daily activities.

**c. Assessment of Self-Assessments and Audits**

**(1) Inspection Scope**

The inspectors assessed the station's ability to identify and enter issues into the station CA program, prioritize and evaluate issues, and implement effective corrective actions, through efforts from departmental assessments and NOS audits.

(2) Assessment

The inspectors concluded that the licensee's departmental assessments and nuclear oversight audits were effective at identifying plant deficiencies and enhancement opportunities at an appropriate threshold level. Assessments and audits were thorough and probing. The auditing and assessing teams were comprised on personnel with appropriate skills, abilities, knowledge, and expertise, which resulted in the identification of plant deficiencies, plant improvement recommendations, and plant strengths. Assessments and audits properly characterized issues, and identified issues were subsequently placed into the CA. One exception was noted as discussed under the identification of issues section of this report. Also, the inspectors concluded that 2007 PI&R FASA was a very good effort that resulted in a quality product.

The 2007 PI&R FASA properly assessed each CA program element of the CA program and determined that the station's CA program was effective. However, the PI&R FASA documented that the requirements for various CA program elements, for a number of isolated cases, were not met. The site's PI&R FASA noted that, although trending was effective at the station, further improvement was needed with the performance of the department CA program coordinators. As a result, the Site CA program Manager increased the meeting frequency, with the department CA program coordinators from once every two to three months to every two weeks. During these meetings, the Site CA program Manager reviewed selected CA closure reviews for lessons learned and departmental CA program trend boards/data for site improvements. The site CA program Manager indicated that these efforts had resulted in improving the performance of the department CA program coordinators during this short time period. Additionally, the Site CA program Manager and the department CA program coordinators planned to develop a CA program coordinator's improvement action plan.

The inspectors' assessment of the station's CA program was consistent with the results documented in the site PI&R FASA. Primarily, the team identified additional examples of the types of deficiencies, in the various CA program elements, that had been identified during the station's PI&R FASA. In addition to similar minor issues identified by the FASA and the NRC inspection teams, two more significant issues were identified by the inspectors as evident by two NRC-identified violations and other observations documented in the inspection report.

The inspectors held discussions with the station NOS manager to obtain a better understanding of NOS activities with respect the underlying attribute of supervisory oversight as a challenge to several problem areas and repeat issues. The NOS manager indicated that the number one concern at the site was operations leadership in driving performance at the station. As a result, configuration control and safety were elements that the Operations Department was not setting the appropriate standards for personnel performance; therefore, problems were occurring as a result of deficient personnel performance. In addressing these issues, the licensee held a Site Wide Standdown in February 2006, and performed a common cause analysis, for human performance errors, which was reviewed by the inspectors.

d. **Assessment of Safety Conscious Work Environment**

(1) Inspection Scope

The inspectors assessed the station's safety conscious work environment through the reviews of the station's employee concern program implementing procedures, discussions with coordinators of the employee concern program, interviews with personnel from various station departments, and reviews of issue reports. The inspectors also reviewed the results from a Safety Culture Survey and the Braidwood Occupation Safety and Health Administration (OSHA) Voluntary Protection Program survey.

(2) Assessment

The NRC 2005 PI&R had documented that a number of plant workers did not understand the purpose of the station's Employee Concern Program (ECP). Some workers were unaware that safety concerns could be raised through the ECP, and other workers indicated that personal problems were addressed through the ECP. The inspectors determined that the licensee appeared to have addressed this issue as reflected by a very integrated ECP into station activities. The ECP coordinators were very active in ensuring station awareness and understanding of the ECP. The coordinators discussed the ECP at maintenance personnel alignment meetings and to new station workers as they were hired at the plant. The results from the interviews of plant staff conducted by the inspectors, it was evident that station personnel understood the purpose of the ECP. Based on discussions with the site and backup ECP Coordinators, the inspectors did not have any concerns with the implementation of the ECP. The ECP Coordinators were properly implementing the site program by ensuring workers' identify were not revealed and properly monitoring the site's corrective action program for issues which would be considered ECP concerns. Additionally, the coordinator properly followed up on issues to ensure a chilled environment did not exist at the station.

The results of the interview with station personnel indicated that plant workers were knowledgeable about the tools available to them for raising nuclear safety concerns. The inspectors did not receive any comments that indicated workers would be hesitant about raising concerns. Furthermore, the workers communicated that station supervision greatly supported the workers' efforts in raising issues. None of the workers indicated that they themselves or their co-workers had been retaliated against for raising safety concerns.

The inspectors reviewed the licensee's Midcycle Safety Culture Questionnaire completed in December 2006. The results of the questionnaire indicated that a safety conscious work environment was in existence at the station. The survey results were consistent with comments made in the OSHA Voluntary Protection Program Survey Results and by the Nuclear Safety Review Board (NSRB). The aspect of supervisory oversight in the field was noted in the survey as an area needing improvement, and this was consistent with the station's focused attention on supervisory oversight.

The inspectors also reviewed the OSHA Voluntary Protection Program Survey Results. This survey was administered in August/September 2006 and sampled 100 percent of station personnel. The inspectors' review of the results indicated that station workers' primary concerns regarding personnel safety were that it appeared that personnel safety took a backseat to outages and high workload times, supervisors did not spend enough time in the plant, and personnel safety issues were not always resolved in a timely manner. The licensee analyzed the comments and subsequently developed a list of focus areas to address the concerns noted by the survey results.

#### 4OA6 Meetings

##### .1 Exit Meeting

The inspectors presented the inspection results to Mr. D. Ambler and other members of licensee management at the conclusion of the inspection on May 1, 2007. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

An interim exit meeting was conducted on March 30, 2007, to discuss the preliminary findings of the inspection with Mr. M. Smith and other members of licensee management. No proprietary information was identified.

#### 4OA7 Licensee-Identified Violations

No findings of significance were identified.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

K. Aleshire, Emergency Preparedness Manager  
D. Ambler, Regulatory Assurance Manager  
D. Burton, Licensed Operator Requalification Training Lead Instructor  
M. Cichon, Licensing Engineer  
L. Coyle, Maintenance Director  
C. Dunn, Site Training Director  
G. Golwitler, Site Corrective Action Program Manager  
R. Leasure, Radiation Protection Technical Manager  
J. Moser, Radiation Protection Manager  
J. Petty, Regulatory Assurance  
B. Schipiour, Work Control Director  
M. Smith, Engineering Director  
P. Summers, Nuclear Oversight Manager  
T. Tierney, Chemistry, Environmental, and Radioactive Waste Manager  
C. Walrath, Operations Shift Operations Supervisor  
R. Wolen, Design Engineering Manager

#### Nuclear Regulatory Commission

R. Skokowski, Chief, Reactor Projects Branch 3  
L. Kozak, Senior Reactor Analyst

#### Illinois Emergency Management Agency

C. Cecil, Head Resident Inspection, Nuclear Facility Safety Illinois Emergency Management Agency

## LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

### Opened

05000451/2007007-01; 05000452/2007007-01	NCV	The licensee's failure to maintain a procedure adequate could have resulted in securing the only remaining residual heat removal pump (Section 4.OA.2.a.1)
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### Closed

05000451/2007007-02; 05000452/2007007-02	NCV	Inadequate extent of condition review which failed to identify that IST testing was not performed for component cooling water systems valves (Section 4.OA.2.a.2)
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### Discussed

None

## LIST OF DOCUMENTS REVIEWED

### ISSUE REPORTS GENERATED DUE TO THE INSPECTION

#### Walkdown

00606529; Minor Oil Leak on 1B SX Pump (1SX01PB); March 20, 2007  
00606470; Small Shaft Packing Leak on 2B SX Strainer (2SX01FB); March 20, 2007

#### CAP

00609112; NRC PI&R ID'D - Concern with MRC/SOC Response to IR 601183; March 26, 2007  
00610562; PI&R ID'D - RP Did not Write IR for IEMA Issues; March 29, 2007  
00610161; NRC PI&R ID'D Concerns with IR Operability Bases Statements; March 28, 2007  
00610159; NRC PI&R ID'D - CAS for M&TE Trend not Effective; March 28, 2007  
00610259; PI&R ID'D - Operating Log Entries not Referencing IR; March 28, 2007  
00610497; NRC PI&R ID'D - No CA to Address Inadequate Brief By RP supervisor;  
March 29, 2007  
00610499; NRC PI&R ID'D - ACIT that Should Have Been a CA Assign (RP); March 29, 2007  
00610507; NRC PI&R ID'D - RP Accountability not Addressed for Survey; March 29, 2007  
00606470; Small Shaft Packing Leak on 2B SX Strainer (2SX01FB); March 20, 2007  
00607571; PI&R ID'D - Enhancement Opportunity for BwOP CC-8; March 22, 2007  
00609263; NRC Questions Why CC Valves in EOP are Not in IST Program; March 27, 2007  
00610437; IST Bases Document Requires Revision; March 29, 2007  
00610514; NRC PI&R ID'D - OE Not Used/Reference in Operations ACE; March 29, 2007  
00610994; NRC Potential Green NCV - Manual CC Valves Not in IST Program;  
March 30, 2007  
00611024; NRC Potential TBD Finding - Procedure BwOP CC-8 Inadequate; March 30, 2007  
00610051; PI&R ID'D - Typographical Errors in Completed CCA; March 27, 2007

#### OE

00610514; NRC PI&R ID'D - OE Not Used/Referenced in Operations ACE; March 29, 2007

### ISSUE REPORTS REVIEWED DURING INSPECTION

#### Operations

00186275; Repeat Maintenance - 2CC9486 Failed Second LLRT (First Rework);  
November 13, 2003  
00353841; Procedure Needed for Swapping U-O CC Heat Exchanger; July 16, 2005  
00367473; Potential Enhancements to Strainer Backwash Response; August 27, 2005  
00383463; Evaluation of 1RY8028 LLRT Results; October 7, 2005  
00434456; Recommendations from 2005 Reactivity Management FASA;  
December 15, 2005  
00435424; FASA Identified Procedure Change OP-AA-300 / WC-AA-105; December 19, 2005  
00441759; Operations Reactivity Management FASA 2006; January 13, 2006  
00441919; Braidwood FASA - In-Service Testing (IST); January 13, 2006  
00445423; Large Number of Consequential Configuration Control Events; January 24, 2006  
00446241; OPEX Review - Lesson Learned from Byron IR 444685/444975; January 26, 2006  
00446244; OPEX Review - Lesson Learned from Byron IR 444975/444499; January 26, 2006

00452245; Unplanned LCO Entry on 2A DG Due to Low Temperature; February 10, 2006  
00457480; Unit 2 RWST Level Slowly Decreasing; February 23, 2006  
00479478; Unplanned LCO Entry into 3.4.12; April 17, 2006  
00484683; 1RY8028 Body to Bonnet Steam Leak; April 29, 2006  
00485871; A1R12 LL 16 percent Level Drop in 1A SI Accum During BwVSR 3.4.14.1;  
May 2, 2006  
00496552; 1B First Stage RDT HI-2 Alarm Failed to Reset During RV/IV SRV; June 5, 2006  
00526168; Potential Unplanned LCO Due to Missed Technical Specification Surveillance;  
August 31, 2006  
00537802; Potential Trend in the In-Service Testing Program (IST); September 29, 2006  
00507945; 1B First Stage RDT HI-2 Alarm Failed to Reset During RV/IV SRV; July 10, 2006  
00523372; Unplanned LCO - Procedure Problem with 1B SSPS Bi-Monthly; August 24, 2006  
00534719; Potential Missed Tech Spec Surveillance; September 22, 2006  
00546312; 2CC9486 Fails Its A2R12 As Found Local Leak Rate Test; October 19, 2006  
00547003; Valve Disc for 2CC9486 (A2R12 Outage); October 20, 2006  
0554857; 2HD005A Acting Erratic; November 7, 2006  
00555147; U-2 Reactor Power Effects During 2HD005A Restoration; November 18, 2006  
00561698; NRC Concerns Identified During U-1 ECCS Vent and Valve Surveillance;  
November 24, 2006  
00568853; NRC ID'D Concern with Past Operability of 2CC9486; December 13, 2006  
00574749; Reactivity Management FASA - Standards Deficiency; January 3, 2007  
00584642; PI&R FASA ID'D - Concern with Response to SX Strainer Finding; January 29, 2007  
00585093; PI&R FASA ID'D - Concern with RCR Quality on 1CV243 Bump Event;  
January 30, 2007  
00585839; PI&R FASA ID'D - Concern with FME Not Wholly Addressed in EACE;  
January 31, 2007  
00594356; Unit 1 Reactor Power Effects During 1MS040D Clearance Order; February 21, 2007  
00468506; 1DO2006B Found Out of Normal Position; March 20, 2006  
00330826; Valve 2RE004B Inadvertently Bumped; May 2, 2005  
00472884; 1FW076 Failed Open Due to 1IA1234 Found 90 percent Closed; March 30, 2006  
00095256; Unplanned Entry Into AAR 2BwOS PR-1a For Failure of 2RR08J; February 14, 2002

#### Operations log entries

Operator logs from 3/16/2007 through 3/18/2007

Operations department memorandum 1-07; Issue Generation and Log Keeping Clarifications;  
February 20, 2007

00582356; PI&R FASA ID'd Operations Log Entries Without Log Entries; January 23, 2007

00607368; TLDs Were Put Thru X Ray Machine; March 22, 2007

#### Radiation Protection

IR485357; Contract Employee Exited PA after Alarming Rad Monitor; May 1, 2006

IR589515; Unacceptable RAD Shipping Practices; February 9, 2007

IR546010; Unexpected ED Alarm 377' IMB Near R24; October 19, 2006

IR528711; Shielding Blankets Need Adjustment to Shield Hot Spot; September 8, 2006

IR528700; RP Source Control Check-in Deficiency; September 5, 2006

IR517975; RAD Source found in Warehouse 15 (Good catch); August 8, 2006

IR515674; Extra RAD Exposure Taken due to Computer EPN Problem; August 1, 2006

IR486492; Relief Valve 1SD016 Isotopically Contaminated; May 4, 2006

IR484195; A1R12 LL ALARA/Shielding Issues w/Westinghouse CRDM Equipment; April, 28, 2006  
499359; Unexpected Electronic Dosimeter Dose Rate Alarm; June 12, 2006  
497545; Level 2 Personnel Contamination Event; June 6, 2006  
499656; NOS ID: Several Outdoor Radiological Postings Found Unsat; June 13, 2006  
547064; Unit 2 reactor Head New O-rings Damaged; October 20, 2006  
589845; NOS ID: Negative Trend in the Lack of Rad-Waste Shipments; February 9, 2007  
482383; Level 3 PCE (Westinghouse); April 22, 2006  
518432; VCT Valve Aisle Contaminated During Fill and Vent; August 9, 2006  
532256; Seavan Number 14 and 27 in degraded Condition; September 2007  
528670; Pipe Requires Flush Flushing to Eliminate Hot Spot Number 59; September 8, 2006  
528681; Pipe Requires Flush flushing to Eliminate Hot Spot Number 54; September 8, 2006  
539072; Pipe Requires flush To Eliminate Rad Hot Spots; October 2, 2006  
481427; A1R12 LL - RP Air Samples are not being Properly Prepared; April 20, 2006  
536685; Elevated Dose Rates on U2 CV Letdown Piping; September 27, 2006  
490604; Increasing Trend In Personnel Contamination Events PCE; May 16, 2006  
523419; Possible Unmonitored Vent Path and Water Leakage U-2 CWA; August 24, 2006  
243310; LHRA Left Unlocked and Unguarded-Tech Spec Violation; August 10, 2004

## **Maintenance**

### **Safety relief valves**

262233; 1SI8853B Failed to Repeat Required Lift Pressure; October 11, 2004  
278269; Relief Valve Failed to Lift; December 1, 2004  
329172; Valve Removed From 2SI8853B Failed Seat Leak & Lift Test; April 27, 2005  
332762; IST Relief Valve 2SI8851 Failed Pressure Test; May 6, 2005  
454898; Need WR For Contingency Work Order for 2SI8853A; February 16, 2006  
459085; Spare Relief Valve From 1SI8853B Failed Testing; February 27, 2006  
507260; Pre-Outage Task for 2SI8858 Performed Three Months Early; July 7, 2006  
534034; Boron Identified on 1SI8851 During U01 ECCS Vent & Valve; September 24, 2006  
546046; 2SI8851 Relief Valve Failed Initial Lift Test Low"; October 19, 2006  
552355; Relief Valve Removed From 2SI8858 Failed Final Seat Leakage; November 2, 2006  
553376; Relief Valve Removed From 2SI8842 Failed Initial Testing; November 4, 2006  
554657; Safety Relief Valve Product Advisory"; November 7, 2006  
565162; Relief Valve S/N N56877-00-0147 Failed Testing; December 4, 2006  
576883; IST Relief Valve 1CS08MB Failed As Found Testing; January 9, 2007  
102884; Pressurizer Safety Valves Test Out of Tolerance; April 8, 2002

### **Maintenance Adverse Trends**

554034; Safety - Contractor Adverse OSHA Recordable Trend; November 6, 2006  
476197; Safety Issue - Potential Negative Trend; April 7, 2006  
385495; Trend - Unsafe work Practices with Working at Heights; October 13, 2006  
584806; PI&R FASA ID'D - Potential Adverse Trend With Safety; January 26, 2007  
546473; A2R12 - Adverse Injury Trend; October 19, 2006  
445525; Potential Adverse Trend in Safety; January 24, 2006  
388537; Potential Trend: Safety Work Practices in Maintenance; October 21, 2005  
540986; CCA, Potential Adverse Trend - Braidwood station Human Performance; January 12, 2007

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484742; "M&TE Being Declared Lost (MMD)"; April 29, 2006  
484745; "M&TE Being Declared Lost (Venture)"; April 29, 2006  
484757; "M&TE Being Declared Lost (Unknown work group)"; April 29, 2006  
509129; "M&TE Being Declared Lost (MMD)"; July 13, 2006  
509438; "M&TE Being Declared Lost (Unknown work group)"; July 14, 2006  
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548931; "M&TE Being Declared Lost (EMD)"; October 25, 2006  
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595596; "M&TE Being Declared Lost (Engineering Work Group)"; February 24, 2007

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595565; NOS ID PDR - Clearance and Tagging Program; February 24, 2007  
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496580; NOS ID'D PDR Maintenance Performance; June 2, 2006  
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481167; NOS Identified an Adverse Trend on Control of Carts; April 20, 2006  
196476-05; Source Accountability and Control Check-In Self Assessment; September 5, 2006  
593726; NOS Elevation Notice Transient Combustible Material Control; February 28, 2007  
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457631; Trend Identified in RP Department Clock Resets; February 23, 2006  
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502360; U-2 SAC has Hi Vibes; June 21, 2006  
501537; U-2 SAC Tripped on Hi Oil Temp; June 19, 2006  
397297; CAP Trend Code Application Deficiency; November 10, 2006  
585860; PI&R FASA ID'D - Trend with Failures on OLIS-CF084; January 26, 2007  
585325; PI&R FASA ID'D - Trend with U-2 SAC Emergent Problems; January 26, 2007  
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BRW MRC Agenda for Wednesday, March 14, 2007  
BRW SOC Agenda for Tuesday, March 13, 2007  
Braidwood; A Day In The Plant Observation; January 10, 2007  
Braidwood; A Day In The Plant Observation; November 14, 2006  
Braidwood; A Day In The Plant Observation; August 1, 2006  
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00291106; Unplanned LCOAR Entry - 2B DG Jacket Water Circ Pump Trips; January 15, 2005  
00306938; Unplanned LCO/Risk Change During ACB 1424 Trip Checks; March 1, 2005  
00370649; 1FW039A Failed 1BwOSR 3.6.3.5.FW-3; September 6, 2005  
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## **DRAWINGS**

M-66 Sheet 2; Diagram of Component Cooling Unit 1; Revision AO  
M-66 Sheet 3A; Diagram of Component Cooling Units 1 and 2; Revision AU  
M-66 Sheet 4D; Diagram of Component Cooling Units 1 and 2; Revision BC  
M-139 Sheet 2; Diagram of Component Cooling Unit 2; Revision AI

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LS-AA-125-1001; Root Cause Analysis Manual; Revision 6  
LS-AA-125-1002; Common Cause Analysis Manual; Revision 5  
LS-AA-125-1003; Apparent Cause Evaluation Manual; Revision 7  
LS-AA-125-1004; Effectiveness Review Manual; Revision 2  
LS-AA-125-1005, Coding and Analysis Manual, Revision 5  
LS-AA-126; Self-Assessment Program; Revision 5  
LS-AA-126-1001; Focused Area Self-Assessments; Revision 4  
LS-AA-126-1005, Check-In Self Assessments, Revision 3  
LS-AA-126-1006, Benchmarking Program, Revision 1  
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2BwEP ES-1.3; Transfer to Cold Leg Recirculation Unit 2; Revision 104  
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583484; Incomplete Training Documentation; January 25, 2007  
585938; HR Identified Gaps In Quals In PQD; January 31, 2007  
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## LIST OF ACRONYMS USED

ACIT	Action Tracking Item
ADAMS	Agency-Wide Document Access and Management System
CA	Corrective Action
CAPR	Corrective Action to Prevent Recurrence
CCA	Common Cause Analysis
CC	Component Cooling
CCW	Component Cooling Water
CFR	Code of Federal Regulation
EACE	Equipment Apparent Cause Evaluation
ECP	Employee Concern Program
EOP	Emergency Operating Procedure
FASA	Focused Area Self Assessment
DRS	Division of Reactor Safety
EOC	Extent of Condition
GPM	Gallons Per Minute
IMC	Inspection Manual Chapter
IR	Issue Report
IST	Inservice Testing
LOCA	Loss of Coolant Accident
MRC	Management Review Committee
NCV	Non-Cited Violation
NOS	Nuclear Oversight
NRC	United States Nuclear Regulatory Commission
OE	Operating Experience
OSHA	Occupation Safety and Health Administration
PI&R	Problem Identification and Resolution
QHPI	Quick Human Performance Investigation
RCA	Root Cause Analysis
RHR	Residual Heat Removal
SDP	Significance Determination Process
SOC	Station Ownership Committee
SRA	Senior Reactor Analyst
TRM	Technical Requirement Manual