



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, IL 60532-4352

February 10, 2009

Mr. Charles G. Pardee
Senior Vice President, Exelon Generation Company, LLC
President and Chief Nuclear Officer (CNO), Exelon Nuclear
4300 Winfield Road
Warrenville IL 60555

SUBJECT: BYRON STATION, UNITS 1 AND 2 INTEGRATED INSPECTION
REPORT 05000454/2008-005 05000455/2008-005

Dear Mr. Pardee:

On December 31, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Byron Station, Units 1 and 2. The enclosed inspection report documents the inspection findings which were discussed on January 15, 2009, with Mr. D. Hoots and other members of your staff.

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

Based on the results of this inspection, two NRC-identified findings of very low safety significance were identified. The findings involved violations of NRC requirements. However, because of their very low safety significance, and because the issues were entered into your corrective action program, the NRC is treating the issues as Non-Cited Violations in accordance with Section VI.A.1 of the NRC Enforcement Policy. Furthermore, four licensee identified violations are listed in Section 4OA7 of this report.

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 Byron Station.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure and your response (if any) 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. 50-454; 50-455
License Nos. NPF-37; NPF-66

Enclosure: Inspection Report No. 05000454/2008-005 and 05000455/2008-005
w/Attachment: Supplemental Information

cc w/encl: Site Vice President - Byron Station
Plant Manager - Byron Station
Manager Regulatory Assurance - Byron Station
Senior Vice President - Midwest Operations
Senior Vice President - Operations Support
Vice President - Licensing and Regulatory Affairs
Director - Licensing and Regulatory Affairs
Manager Licensing - Braidwood, Byron, and LaSalle
Associate General Counsel
Document Control Desk - Licensing
Assistant Attorney General
Illinois Emergency Management Agency
J. Klinger, State Liaison Officer,
Illinois Emergency Management Agency
P. Schmidt, State Liaison Officer, State of Wisconsin
Chairman, Illinois Commerce Commission
B. Quigley, Byron Station

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Manager Licensing - Braidwood, Byron, and LaSalle
Associate General Counsel
Document Control Desk - Licensing
Assistant Attorney General
Illinois Emergency Management Agency
J. Klinger, State Liaison Officer,
Illinois Emergency Management Agency
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SUBJECT: BYRON STATION, UNITS 1 AND 2 INTEGRATED INSPECTION REPORT
05000454/2008-005 05000455/2008-005

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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 50-454; 50-455
License Nos: NPF-37; NPF-66

Report Nos: 05000454/2008-005 and 05000455/2008-005

Licensee: Exelon Generation Company, LLC

Facility: Byron Station, Units 1 and 2

Location: Byron, IL

Dates: October 1, 2008, through December 31, 2008

Inspectors: B. Bartlett, Senior Resident Inspector
R. Ng, Resident Inspector
J. Cassidy, Senior Health Physicist
A. Dunlop, Reactor Inspector
B. Jones, Reactor Inspector
D. Jones, Reactor Inspector
R. Langstaff, Reactor Inspector
D. McNeil, Reactor Inspector
R. Winter, Reactor Inspector
C. Thompson, Resident Inspector
Illinois Department of Emergency Management

Observer: J. Gilliam, Reactor Engineer

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

Enclosure

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SUMMARY OF FINDINGS

IR 05000454/2008-005, 05000454/2008-005; October 1 – December 31, 2008; Byron Station, Units 1 & 2; Refueling and Other Outage Activities, and Access Control to Radiologically Significant Areas.

This report covers a 3-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. Two Green findings were identified by the inspectors. The findings were considered to be Non-Cited Violations of NRC regulations. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealed Findings

Cornerstone: Mitigating Systems

Green. The inspectors identified a finding of very low safety significance and associated Non-Cited Violation (NCV) of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to follow procedure BAP 1450-1, "Access to Containment." Specifically, the inspectors determined that the licensee failed to remove loose debris items from Unit 2 containment prior to Mode 4 or to perform an engineering evaluation per procedure. The licensee entered this issue into the corrective action program (CAP) as Issue Report (IR) 867171, removed the loose debris, and completed an evaluation to verify that the containment sump was not adversely affected.

The finding is more than minor because, if left uncorrected, the issue could have become a more significant safety concern. The inspectors evaluated the finding using IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Finding," dated January 10, 2008, for the Mitigating Systems Cornerstone. Since this finding was not a design or qualification deficiency, did not result in loss of system or train safety function, and was not safety significant due to external events, this issue is screened as very low safety significance. This finding is related to the Work Control component of the Human Performance cross-cutting area for the licensee's failure to coordinate work activities and the need for work groups to coordinate with each other. (H.3(b)) The personnel who left the material in containment assumed it was acceptable as they had documented the material in a surveillance data sheet, and the personnel who reviewed the completed data sheet assumed the material had been or would be removed from containment, and none questioned the potential impact upon the recirculation sump screens or coordinated with each other to ensure resolution of the material prior to a mode change. (Section 1R20.b)

Cornerstone: Occupational Radiation Safety

Green. The inspectors identified a finding of very low safety significance and associated NCV of Technical Specification 5.4.1 for failure to implement procedures required to evaluate radiological hazards for airborne radioactivity. Specifically, the inspectors

identified that the licensee failed to re-start an air sampler on the refuel floor which provided the only air monitoring system while workers were performing activities in the area. The corrective actions taken by the licensee included starting the required air sampler. The issue was entered in the licensee's corrective action program as IR 828767.

The finding is more than minor because it impacted the program and process attribute of the Occupational Radiation Safety Cornerstone and affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation, in that the failure to fully evaluate the radiological hazards present in work areas could result in unplanned exposure to workers. The finding was determined to be of very low safety significance because it was not an As-Low-As-Is-Reasonably-Achievable (ALARA) planning issue, there was no overexposure nor potential for overexposure, and the licensee's ability to assess dose was not compromised. This finding was caused by inadequate self-checking and peer checking. Consequently, the cause of this deficiency had a cross-cutting aspect in the area of Human Performance. (H.4(a)) Specifically, the licensee failed to utilize human error prevention techniques commensurate with the risk of the task. (Section 2OS1.1)

B. Licensee-Identified Violations

Four violations of very low safety significance that were identified by the licensee have been reviewed by inspectors. Corrective actions planned or taken by the licensee have been entered into the licensee's CAP. These violations and corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 operated at or near full power throughout the inspection period with minor exceptions.

Unit 2 operated at or near full power throughout the inspection period with one exception. Unit 2 was in a refueling outage from October 6 through October 24, 2009.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

.1 Winter Seasonal Readiness Preparations

a. Inspection Scope

The inspectors conducted a review of the licensee's preparations for winter conditions to verify that the plant's design features and implementation of procedures were sufficient to protect mitigating systems from the effects of adverse weather. Documentation for selected risk-significant systems was reviewed to ensure that these systems would remain functional when challenged by inclement weather. During the inspection, the inspectors focused on plant specific design features and the licensee's procedures used to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. Cold weather protection, such as heat tracing and area heaters, was verified to be in operation where applicable. The inspectors also reviewed corrective action program (CAP) items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their CAP in accordance with station corrective action procedures. Specific documents reviewed during this inspection are listed in the Attachment. The inspectors' reviews focused specifically on the following plant systems due to their risk significance or susceptibility to cold weather issues:

- Diesel Generator Ventilation; and
- Essential Service Water Cooling Towers.

This inspection constituted one winter seasonal readiness preparations sample as defined in IP 71111.01-05.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

The inspectors performed partial system walkdowns of the following risk-significant systems:

- Unit 2 Train B Auxiliary Feedwater System following Refueling Outage Maintenance;
- Unit 2 Essential Service Water System Following Refueling Outage; and
- Unit 1 Train A Diesel Generator While Unit 1 Train B Diesel Generator was Out of Service.

The inspectors selected these systems based on their risk significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could impact the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, UFSAR, Technical Specification (TS) requirements, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment.

These activities constituted three partial system walkdown samples as defined in IP 71111.04-05.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

The inspectors conducted fire protection walkdowns that were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- Division 12 Switchgear Room (Zone 5.1-1);
- Division 21 Switchgear Room (Zone 5.6-2);

- Auxiliary Building Elevation 451 (Zone 5.6-1);
- Auxiliary Building Elevation 426 (Zone 5.1-1);
- Auxiliary Building Elevation 426 (Zone 5.2-1); and
- Auxiliary Building Elevation 383 (Zone 11.4-0).

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, maintained passive fire protection features in good material condition, and had implemented adequate compensatory measures for out of service, degraded or inoperable fire protection equipment, systems, or features in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the Attachment, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed, that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's CAP.

These activities constituted six quarterly fire protection inspection samples as defined in IP 71111.05-05.

b. Findings

No findings of significance were identified.

.2 Annual Fire Protection Drill Observation (71111.05A)

a. Inspection Scope

On September 14 and 21, 2008, the inspectors observed a fire brigade activation for a Security Diesel Charger Fire. Based on this observation, the inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that the licensee staff identified deficiencies; openly discussed them in a self-critical manner at the drill debrief, and took appropriate corrective actions. Specific attributes evaluated were: (1) proper wearing of turnout gear and self-contained breathing apparatus; (2) proper use and layout of fire hoses; (3) employment of appropriate fire fighting techniques; (4) sufficient firefighting equipment brought to the scene; (5) effectiveness of fire brigade leader communications, command, and control; (6) search for victims and propagation of the fire into other plant areas; (7) smoke removal operations; (8) utilization of pre planned strategies; (9) adherence to the pre-planned drill scenario; and (10) drill objectives. In addition, the inspectors evaluated the fire brigade's training qualification and the licensee's self-contained breathing apparatus inspection and maintenance program. Documents reviewed are listed in the Attachment to this report.

These activities constituted one annual fire protection inspection sample as defined by IP 71111.05-05.

b. Findings

No findings of significance were identified.

1R06 Flooding (71111.06)

.1 Internal Flooding

a. Inspection Scope

The inspectors reviewed selected risk important plant design features and licensee procedures intended to protect the plant and its safety related equipment from internal flooding events. The inspectors reviewed flood analyses and design documents, including the UFSAR, engineering calculations, and abnormal operating procedures to identify licensee commitments. The specific documents reviewed are listed in the Attachment to this report. In addition, the inspectors reviewed licensee drawings to identify areas and equipment that may be affected by internal flooding caused by the failure or misalignment of nearby sources of water, such as the fire suppression or the circulating water systems. The inspectors also reviewed the licensee's corrective action documents with respect to past flood-related items identified in the corrective action program to verify the adequacy of the corrective actions. The inspectors performed a walkdown of the following plant area(s) to assess the adequacy of watertight doors and verify drains and sumps were clear of debris and were operable, and that the licensee complied with its commitments:

- Turbine Building Internal Flooding.

This inspection constituted one internal flooding sample as defined in IP 71111.06-05.

b. Findings

No findings of significance were identified.

1R07 Annual Heat Sink Performance (71111.07)

.1 Heat Sink Performance

a. Inspection Scope

The inspectors reviewed the licensee's testing of Unit 2 Train B Diesel Generator Jacket Water Heat Exchanger and Unit 2 Train C Reactor Containment Fan Cooler (RCFC) Heat Exchanger to verify that potential deficiencies did not mask the licensee's ability to detect degraded performance, to identify any common cause issues that had the potential to increase risk, and to ensure that the licensee was adequately addressing problems that could result in initiating events that would cause an increase in risk. The inspectors reviewed the licensee's observations as compared against acceptance criteria, the correlation of scheduled testing and the frequency of testing, and the impact of instrument inaccuracies on test results. Inspectors also verified that test acceptance criteria considered differences between test conditions, design conditions, and testing conditions. Documents reviewed are listed in the Attachment to this report.

This annual heat sink performance inspection constituted two samples as defined in IP 71111.07-05.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Resident Inspector Quarterly Review (71111.11Q)

a. Inspection Scope

On November 4, 2008, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator requalification examinations to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- licensed operator performance;
- crew's clarity and formality of communications;
- ability to take timely actions in the conservative direction;
- prioritization, interpretation, and verification of annunciator alarms;
- correct use and implementation of abnormal and emergency procedures;
- control board manipulations;
- oversight and direction from supervisors; and
- ability to identify and implement appropriate TS actions and Emergency Plan actions and notifications.

The crew's performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one quarterly licensed operator requalification program sample as defined in IP 71111.11.

b. Findings

No findings of significance were identified.

.2 Licensed Operator Requalification Program (LORT)

a. Inspection Scope

The inspectors performed an inspection of the licensee's LORT test/examination program for compliance with the station's Systems Approach to Training (SAT) program which would satisfy the requirements of 10 CFR 55.59(c)(4). The reviewed operating examination material consisted of six operating tests, each containing two or three dynamic simulator scenarios per operating test and 36 job performance measures (JPMs). The written examinations reviewed consisted of six written examinations, each including a Part A, Plant and Control Systems, and Part B, Administrative

Controls/Procedure Limits. The examinations contained approximately 35 questions. The inspectors reviewed the annual requalification operating test and biennial written examination material to evaluate general quality, construction, and difficulty level. The inspectors assessed the level of examination material duplication from week-to-week during the current year operating test. The examiners assessed the amount of written examination material duplication from week-to-week for the written examination administered in 2006. The inspectors reviewed the methodology for developing the examinations, including the LORT program 2-year sample plan, probabilistic risk assessment insights, previously identified operator performance deficiencies, and plant modifications. The documents reviewed during this inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

.3 Annual Operating Test Results

a. Inspection Scope

The inspectors reviewed the overall pass/fail results of the biennial written examination, the individual JPM operating tests, and the simulator operating tests, which were required to be given per 10 CFR 55.59(a)(2)) administered by the licensee from September 22, 2008, through December 15, 2008, as part of the licensee's operator licensing requalification cycle. These results were compared to the thresholds established in IMC 0609, Appendix I, "Licensed Operator Requalification Significance Determination Process (SDP)." The evaluations were also performed to determine if the licensee effectively implemented operator requalification guidelines established in NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," and Inspection Procedure 71111.11, "Licensed Operator Requalification Program." The documents reviewed during this inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations (71111.12Q)

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk significant systems:

- Auxiliary Building Ventilation System;
- Unit 1 Train A Diesel Generator Ventilation Failure; and
- Unit 2 Train A Diesel Generator Failure to Start During Manual Start Surveillance.

The inspectors reviewed events such as where ineffective equipment maintenance had resulted in valid or invalid automatic actuations of engineered safeguards systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- implementing appropriate work practices;
- identifying and addressing common cause failures;
- scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring;
- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- verifying appropriate performance criteria for structures, systems, and components (SSCs)/functions classified as (a)(2) or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

This inspection constituted three quarterly maintenance effectiveness samples as defined in IP 71111.12-05.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed the licensee's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- Unit 0 Component Cooling Heat Exchanger Out of Service while Unit 2 Train B Diesel Generator was Out Of Service (OOS) and Bus Tie Breaker 12-13 was open;
- Shutdown Safety during Core Reload with Essential Service Water System Return X-Tie Valve & Unit 0 Component Cooling Heat Exchanger OOS
- Unit 2 Train A Residual Heat Removal System Work Window while Unit 2 Component Cooling Heat Exchanger was OOS; and
- Unit 2 Train A Diesel Generator Failure to Start During Manual Start Surveillance.

These activities were selected based on their potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4) and were accurate and complete. When emergent work was performed, the inspectors verified that the

plant risk was promptly reassessed and managed. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed TS requirements and walked down portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met. Documents reviewed are listed in the Attachment to this report.

These maintenance risk assessments and emergent work control activities constituted four samples as defined in IP 71111.13-05.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- Unit 2 Train B Auxiliary Feedwater Pump Jacket Water System Overflow;
- Unit 1 Loose Part Monitoring System Noise;
- Unit 2 Train B Containment Sump Isolation Valve Motor Degradation; and
- Unit 1 Train B Diesel Generator Cylinder and Head Indications.

The inspectors selected these potential operability issues based on the risk-significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TS and UFSAR to the licensee's evaluations, to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors also reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment to this report.

This operability inspection constituted four samples as defined in IP 71111.15-05

b. Findings

No findings of significance were identified.

1R18 Plant Modifications (71111.18)

.1 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the following temporary modification:

- Temporary Line to Connect the Drain Lines of Unit 2 A and D Reactor Coolant Pump Standpipes.

The inspectors compared the temporary configuration change and associated 10 CFR 50.59 screening and evaluation information against the design basis, the UFSAR, and the TS, as applicable, to verify that the modification did not affect the operability or availability of the affected system. The inspectors also compared the licensee's information to operating experience information to ensure that lessons learned from other utilities had been incorporated into the licensee's decision to implement the temporary modification. The inspectors verified that as applicable that the modifications operated as expected; modification testing adequately demonstrated continued system operability, availability, and reliability; and that operation of the modifications did not impact the operability of any interfacing systems. Lastly, the inspectors discussed the temporary modification with operations, and engineering personnel to ensure that the individuals were aware of how extended operation with the temporary modification in place could impact overall plant performance. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one temporary modification sample as defined in IP 71111.18-05.

b. Findings

No findings of significance were identified.

.2 Permanent Plant Modifications

a. Inspection Scope

The following engineering design package was reviewed and selected aspects were discussed with engineering personnel:

- Unit 2 Residual Heat Removal System Vent Valve Addition.

This document and related documentation were reviewed for adequacy of the associated 10 CFR 50.59 safety evaluation screening, consideration of design parameters, implementation of the modification, post-modification testing, and relevant procedures, design, and licensing documents were properly updated. The inspectors observed ongoing and completed work activities to verify that installation was consistent with the design control documents. The modification added vent locations to safety related piping in order to allow the removal of air/voids as necessary such as following maintenance. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one permanent plant modification sample as defined in IP 71111.18-05.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the following post-maintenance (PM) activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- Unit 2 Safety Injection System Accumulator Injection Check Valve 2SI8818C Repair;
- Unit 2 Charging/Safety Injection System Flow Balance following Outage Maintenance;
- Unit 1 Train B Charging Pump Return to Service Following Maintenance;
- Unit 2 Train B Auxiliary Feedwater Valve Emergency Actuation Signal Verification Test;
- Work Order (WO) 1171264, Operate Diesel Generator 2A in Local Following Switch Repair;
- WO 00999110, Unit 1 Train B RCFC Following Breaker Maintenance; and
- Relay Actuation Surveillance 2BOSR 3.2.8-632A to Test Valve 2AF004A.

These activities were selected based upon the structure, system, or component's ability to impact risk. The inspectors evaluated these activities for the following (as applicable): the effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed; acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate; tests were performed as written in accordance with properly reviewed and approved procedures; equipment was returned to its operational status following testing (temporary modifications or jumpers required for test performance were properly removed after test completion), and test documentation was properly evaluated. The inspectors evaluated the activities against TS, the UFSAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with post-maintenance tests to determine whether the licensee was identifying problems and entering them in the CAP and that the problems were being corrected commensurate with their importance to safety. Documents reviewed are listed in the Attachment to this report.

This inspection constituted seven post-maintenance testing samples as defined in IP 71111.19-05.

b. Findings

No findings of significance were identified.

1R20 Outage Activities (71111.20)

a. Inspection Scope

The inspectors reviewed the Outage Safety Plan (OSP) and contingency plans for the Unit 2 refueling outage (RFO - B2R14), conducted October 6 through October 24, 2008, that the licensee had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense-in-depth. During the RFO, the inspectors observed portions of the shutdown and cooldown processes and monitored licensee controls over the outage activities listed below. Documents reviewed during the inspection are listed in the Attachment to this report.

- Licensee configuration management, including maintenance of defense-in-depth commensurate with the OSP for key safety functions and compliance with the applicable TS when taking equipment out-of-service.
- Implementation of clearance activities and confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing.
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication, accounting for instrument error.
- Controls over the status and configuration of electrical systems to ensure that TS and OSP requirements were met, and controls over switchyard activities.
- Monitoring of decay heat removal processes, systems, and components.
- Controls to ensure that outage work was not impacting the ability of the operators to operate the spent fuel pool cooling system.
- Reactor water inventory controls including flow paths, configurations, and alternative means for inventory addition, and controls to prevent inventory loss.
- Controls over activities that could affect reactivity.
- Refueling activities, including fuel handling.
- Startup and ascension to full power operation, tracking of startup prerequisites, walkdown of the containment to verify that debris had not been left which could block emergency core cooling system suction strainers, and reactor physics testing.
- Licensee identification and resolution of problems related to RFO activities.

This inspection constituted one RFO sample as defined in IP 71111.20-05.

b. Findings

Introduction: The inspectors identified a finding of very low safety significance and an associated NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to follow Procedure BAP 1450-1, "Access to Containment."

Description: On October 22, 2008, the licensee was in the process of restarting Unit 2 from the refueling outage. The inspectors performed an assessment for loose debris inside of containment following the licensee's completion of their readiness for changing from Mode 5 to Mode 4. During the assessment, the inspectors identified items that required removal prior to the change in mode, most of which were of a minor nature.

Examples included pieces of duct tape, cable ties, several signs, and some trash. However, items found on the polar crane and items that had been left to support control rod drop timing testing were required by procedure either to be removed prior to Mode 4 or to have an engineering analysis to support their presence inside containment in Mode 4 and above.

In Mode 4 and above, the licensee was required by TS to have the emergency sump operable and thus containment cleanliness was required. At the time when the inspectors performed their assessment of containment cleanliness, the licensee was in Mode 5 but was within hours of making the change to Mode 4. Therefore, at the time of identification by the inspectors, the items were not a challenge to the TS requirements but should have been removed in preparation for the mode change. The items left for the control rod drop testing were evaluated by engineering to be left and found to be acceptable. However, due to an internal licensee miss-communication, the items on the polar crane were left in place without an engineering evaluation performed. This condition was not identified until after Mode 4 was achieved. In addition, the licensee's IR, which documented the items found by the inspectors, stated that items on the polar crane were removed; when in fact, they were still on the crane.

The items that had been left through the mode change into Mode 4 were subsequently evaluated by the licensee as being acceptable and not a significant challenge to blocking the containment recirculation sump screens following a postulated accident. After the final use of the polar crane, these items were removed. They consisted mainly of work orders, copies of procedures, and fibrous rope.

Analysis: The inspectors determined that the failure to remove loose debris items from containment prior to Mode 4 or to perform an engineering evaluation as required by procedure was a performance deficiency warranting a significance determination. Using IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," dated September 20, 2007; the inspectors concluded that the finding was greater than minor because, if left uncorrected, the issue could have become a more significant safety concern. The inspectors evaluated the finding using IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Finding," dated January 10, 2008, for the Mitigating Systems Cornerstone. Since this finding was not a design or qualification deficiency, did not result in loss of system or train safety function and was not safety significant due to external events, it was screened as very low safety significance (Green).

This finding is related to the Work Control component of the Human Performance cross-cutting area for the licensee's failure to coordinate work activities and the need for work groups to coordinate with each other. The personnel who left the material in containment assumed it was acceptable as they had documented the material in a surveillance data sheet and the personnel who reviewed the completed data sheet assumed the material had been or would be removed from containment and none questioned the potential impact upon the recirculation sump screens or coordinated with each other to ensure resolution of the material prior to a mode change. (H.3(b))

Enforcement: 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by procedures and accomplished in accordance to these procedure. Byron Administrative Procedure BAP 1450-1, Revision 37, "Access to Containment," was written in

accordance with Appendix B. Step 3.2.1 stated in part that, "Tools and Equipment taken into containment in Modes 1, 2, 3, or 4 will be removed when personnel exit containment. Engineering evaluation and approval is required to leave materials, tools, and equipment unattended in containment." Contrary to the above, on October 22, 2008, the inspectors identified that licensee personnel left material inside of containment in Mode 5 with the knowledge that the material would remain present in Mode 4 and Mode 3 and an engineering evaluation had not been performed. Because this violation was of very low safety significance and was captured in the licensee's corrective action program (IR 835427), it is being treated as a NCV consistent with Section VI.A.1 of the NRC Enforcement Policy. (NCV 05000455/2008005-01)

The inspectors determined that the licensee's subsequent failure to promptly correct the loose debris left inside of containment even though the items had been entered into the corrective action system was a performance deficiency. Since this violation was licensee-identified, the enforcement aspect and its safety significance are described in Section 4OA7 of this report.

1R22 Surveillance Testing (71111.22)

.1 Routine Surveillance Testing

a. Inspection Scope

The inspectors reviewed the test results for the following activities to determine whether risk-significant systems and equipment were capable of performing their intended safety function and to verify testing was conducted in accordance with applicable procedural and TS requirements:

- Unit 2 Train B Diesel Generator 18-month Safety Injection Signal Override Test;
- Unit 2 Train B Auxiliary Feedwater Valve Verification Test;
- Unit 2 Train A Diesel Generator Operability Surveillance; and
- Unit 2 Train B Auxiliary Feedwater Pump Monthly Surveillance.

The inspectors observed in-plant activities and reviewed procedures and associated records to determine the following:

- did preconditioning occur;
- were the effects of the testing adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- were acceptance criteria clearly stated, demonstrated operational readiness, and consistent with the system design basis;
- plant equipment calibration was correct, accurate, and properly documented;
- as-left setpoints were within required ranges; and the calibration frequency were in accordance with TSs, the USAR, procedures, and applicable commitments;
- measuring and test equipment calibration was current;
- test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied;

- test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used;
- test data and results were accurate, complete, within limits, and valid;
- test equipment was removed after testing;
- where applicable for inservice testing activities, testing was performed in accordance with the applicable version of Section XI, American Society of Mechanical Engineers code, and reference values were consistent with the system design basis;
- where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable;
- where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure;
- where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished;
- prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test;
- equipment was returned to a position or status required to support the performance of its safety functions; and
- all problems identified during the testing were appropriately documented and dispositioned in the CAP.

Documents reviewed are listed in the Attachment to this report.

This inspection constituted four routine surveillance testing samples, as defined in IP 71111.22, Section -05.

b. Findings

No findings of significance were identified.

.2 Inservice Testing (IST) Surveillance

a. Inspection Scope

The inspectors reviewed the test results for the following activities to determine whether risk-significant systems and equipment were capable of performing their intended safety function and to verify testing was conducted in accordance with applicable procedural and TS requirements:

- Unit 2 Charging/Safety Injection System Flow Balance; and
- Unit 2 Reactor Coolant System Pressure Isolation Valve and Cold Leg Injection Isolation Valve Leakage Surveillance.

The inspectors observed in-plant activities and reviewed procedures and associated records to determine whether: any preconditioning occurred; effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing; acceptance criteria were clearly stated, demonstrated

operational readiness, and were consistent with the system design basis; plant equipment calibration was correct, accurate, and properly documented; as left setpoints were within required ranges; and the calibration frequency were in accordance with TSs, the UFSAR, procedures, and applicable commitments; measuring and test equipment calibration was current; test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied; test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used; test data and results were accurate, complete, within limits, and valid; test equipment was removed after testing; where applicable for inservice testing activities, testing was performed in accordance with the applicable version of Section XI, American Society of Mechanical Engineers Code, and reference values were consistent with the system design basis; where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable; where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure; where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished; prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test; equipment was returned to a position or status required to support the performance of its safety functions; and all problems identified during the testing were appropriately documented and dispositioned in the corrective action program. Documents reviewed are listed in the Attachment.

This inspection constituted two inservice inspection samples as defined in Inspection Procedure 71111.22.

b. Findings

No findings of significance were identified.

.3 Containment Isolation Valve Testing

The inspectors reviewed the test results for the following activity to determine whether the risk-significant system and equipment were capable of performing their intended safety function and to verify testing was conducted in accordance with applicable procedural and TS requirements:

- Local Leak Rate Test for Containment Isolation Valve 1RY8028.

The inspectors observed in-plant activities and reviewed procedures and associated records to determine whether: any preconditioning occurred; effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing; acceptance criteria were clearly stated, demonstrated operational readiness, and were consistent with the system design basis; plant equipment calibration was correct, accurate, and properly documented; as left setpoints were within required ranges; and the calibration frequency were in accordance with TSs, the UFSAR, procedures, and applicable commitments; measuring and test equipment calibration was current; test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied; test

frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used; test data and results were accurate, complete, within limits, and valid; test equipment was removed after testing; where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable; where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished; prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test; equipment was returned to a position or status required to support the performance of its safety functions; and all problems identified during the testing were appropriately documented and dispositioned in the CAP. Documents reviewed were listed in the Attachment.

This inspection constituted one containment isolation valve inspection sample as defined in IP 71111.22-05.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a licensee unannounced off-hour drive-in drill on November 12, 2008, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the Technical Support Center and Operation Support Center to determine whether the event classification, notifications, protective action recommendations and associated response activities were performed in accordance with procedures. The inspectors also attended the licensee drill critique to compare any inspector-observed weakness with those identified by the licensee staff in order to evaluate the critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the corrective action program. As part of the inspection, the inspectors reviewed the drill package and other documents listed in the Attachment to this report.

This emergency preparedness drill inspection constituted one sample as defined in IP 71114.06-05.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01)

.1 Plant Walkdowns and Radiation Work Permit Reviews

a. Inspection Scope

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

- Unit 2 Containment Building; and
- Auxiliary Building.

This inspection supplements the sample reported in Inspection Report 05000454/2008002; 05000455/2008002.

The inspectors reviewed the radiation work permits (RWPs) and work packages used to access these areas and other high radiation work areas. The inspectors assessed the work control instructions and control barriers specified by the licensee. Electronic dosimeter alarm set points for both integrated dose and dose rate were evaluated for conformity with survey indications and plant policy. The inspectors interviewed workers to verify that they were aware of the actions required if their electronic dosimeters noticeably malfunctioned or alarmed.

This inspection supplements the sample reported in Inspection Report 05000454/2008002; 05000455/2008002.

The inspectors also reviewed the licensee's physical and programmatic controls for highly activated and/or contaminated materials (non-fuel) stored within the spent fuel pool or other storage pools. Documents reviewed were listed in the Attachment.

This inspection constitutes one sample as defined in IP 71121.01-5.

b. Findings

Introduction: A Green NRC-identified finding of very low safety significance and associated NCV of TS 5.4.1 was identified for failure to implement procedures required to evaluate radiological hazards for airborne radioactivity.

Description: The inspectors identified that required air samples were not performed while workers in the reactor cavity were performing reactor disassembly, during the refueling outage in October 2008. Additionally, a continuous air sampler was not operating on the 426' elevation of containment.

Airborne radioactivity surveys verify that the radiological conditions are similar to the conditions predicted during as-low-as-is-reasonably-achievable (ALARA) Planning.

Air samples also validate that the controls specified in the ALARA Plan adequately protect the workers from unnecessary radiation exposure. The evaluation of the radiological conditions associated with reactor disassembly was documented in RWP and ALARA Plan 10008916. The ALARA Plan required continuous air sampling in the reactor cavity in accordance with licensee Procedure RP-AA-302. Continuous air sampling involved an air sample system consists of a pump and a filter. The filter is changed periodically and analyzed for radioactivity deposits. On October 8, 2008, the filter was removed during the previous shift and not replaced with a new filter. The on-coming shift assumed that a new air sample filter was replaced and that the air sampler was returned to service. The on-coming shift allowed work crews to enter the reactor cavity to perform reactor disassembly activities without validating this assumption.

The inspectors reviewed the corrective actions and ensured that a filter was installed and the pump was operating before leaving containment. Additionally, the licensee planned to evaluate the issue and to prescribe long-term actions to prevent recurrence.

Analysis: The inspectors determined that this finding was a performance deficiency because licensees are required to comply with TS requirements and implement various radiological control procedures. The inspectors also determined that the deficiency was reasonably within the licensee's ability to foresee and correct. The finding is more than minor because it is associated with the Occupational Radiation Safety cornerstone attribute of Program and Process and adversely affects the cornerstone objective of protecting worker health and safety from exposure to radiation. Specifically, the failure to perform required air sampling impacted the licensee's ability to prevent an unplanned personnel exposure. The finding was assessed using the Occupational Radiation Safety SDP. The finding was determined to be of very low safety significance (Green), because it was not an ALARA planning issue, there was no overexposure or potential for overexposure, and the licensee's ability to assess dose was not compromised.

As described above, this finding was caused by inadequate self-checking and peer checking. Consequently, the cause of this finding had a cross-cutting aspect in the area of Human Performance. Specifically, the licensee failed to utilize human error prevention techniques commensurate with the risk of the task. (H.4(a))Enforcement: Technical Specification 5.4.1.a. requires that the licensee establish, implement, and maintain procedures specified in Regulatory Guide 1.33, Revision 2, Appendix A, which specifies procedure for airborne radiation monitoring and for implementing the ALARA program. Radiation Protection Procedure RP-AA-401, "Operational ALARA Planning and Controls," Revision 9, outlines the requirements for ALARA Plans and requires that ALARA plans be developed and implemented. The ALARA Plan that evaluated reactor disassembly and provided the methods and controls associated with reactor disassembly activities was documented for RWP 10008916. One of the prescribed controls included in this ALARA Plan required continuous air sampling in the cavity. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program as IR 828767, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy. (NCV 05000454/2008005-02; 05000455/2008005-02)

.2 Job-In-Progress Reviews

a. Inspection Scope

The inspectors observed the following two jobs that were being performed in radiation areas, airborne radioactivity areas, or high radiation areas for observation of work activities that presented the greatest radiological risk to workers:

- Cleaning and Eddy Current Testing of the Seal Table; and
- Dye Penetrant Testing of Reactor Head Penetration 68.

The inspectors reviewed radiological job requirements for these activities, including RWP requirements and work procedure requirements and attended ALARA job briefings.

This inspection supplements the sample reported in Inspection Report 05000454/2008002; 05000455/2008002.

Job performance was observed with respect to the radiological control requirements to assess whether radiological conditions in the work area were adequately communicated to workers through pre-job briefings and postings. The inspectors evaluated the adequacy of radiological controls, including required radiation, contamination, and airborne surveys for system breaches; radiation protection job coverage, including any applicable audio and visual surveillance for remote job coverage; and contamination controls. Documents reviewed were listed in the Attachment.

This inspection supplements the sample reported in Inspection Report 05000454/2008002; 05000455/2008002.

b. Findings

No findings of significance were identified.

.3 High Risk Significant, High Dose Rate, High Radiation Area, and Very High Radiation Area Controls

a. Inspection Scope

The inspectors held discussions with the Radiation Protection Manager concerning high dose rate, high radiation area and very high radiation area controls and procedures, including procedural changes that had occurred since the last inspection, in order to assess whether any procedure modifications substantially reduced the effectiveness and level of worker protection.

The inspectors discussed with radiation protection supervisors the controls that were in place for special areas of the plant that had the potential to become very high radiation areas during certain plant operations. The inspectors assessed if plant operations required communication beforehand with the radiation protection group, so as to allow corresponding timely actions to properly post and control the radiation hazards. Documents reviewed were listed in the Attachment.

This inspection constitutes one sample as defined in IP 71121.01-5.

b. Findings

No findings of significance were identified.

.4 Radiation Worker Performance

a. Inspection Scope

The inspectors reviewed radiological problem reports for which the cause of the event was due to radiation worker errors to determine if there was an observable pattern traceable to a similar cause and to determine if this perspective matched the corrective action approach taken by the licensee to resolve the reported problems. Problems or issues with planned or completed corrective actions were discussed with the Radiation Protection Manager. Documents reviewed were listed in the Attachment.

This inspection constitutes one sample as defined in IP 71121.01-5.

b. Findings

No findings of significance were identified.

.5 Radiation Protection Technician Proficiency

a. Inspection Scope

The inspectors reviewed radiological problem reports for which the cause of the event was radiation protection technician error to determine if there was an observable pattern traceable to a similar cause and to determine if this perspective matched the corrective action approach taken by the licensee to resolve the reported problems. Documents reviewed were listed in the Attachment.

This inspection constitutes one sample as defined in IP 71121.01-5.

b. Findings

No findings of significance were identified.

2OS2 As-Low-As-Reasonably-Achievable Planning and Controls (71121.02)

.1 Radiological Work Planning

a. Inspection Scope

The inspectors evaluated the licensee's list of work activities ranked by estimated exposure that were in progress and reviewed the following two work activities of highest exposure significance:

- Cleaning and Eddy Current Testing of the Seal Table; and
- Dye Penetrant Testing of Reactor Head Penetration 68.

This inspection supplements the sample reported in Inspection Report 05000454/2008002; 05000455/2008002.

For these two activities, the inspectors reviewed the ALARA work activity evaluations, exposure estimates, and exposure mitigation requirements in order to verify that the licensee had established procedures and engineering and work controls that were based on sound radiation protection principles in order to achieve occupational exposures that were ALARA. The inspectors also determined if the licensee had reasonably grouped the radiological work into work activities, based on historical precedence, industry norms, and/or special circumstances.

This inspection supplements the sample reported in Inspection Report 05000454/2008002; 05000455/2008002.

Documents reviewed were listed in the Attachment.

b. Findings

No findings of significance were identified.

.2 Radiation Worker Performance

a. Inspection Scope

Radiation worker and radiation protection technician performance was observed during work activities being performed in radiation areas, airborne radioactivity areas, and high radiation areas that presented the greatest radiological risk to workers. The inspectors evaluated whether workers demonstrated the ALARA philosophy by being familiar with the scope of the work activity and tools to be used, by utilizing ALARA low dose waiting areas, and by complying with work activity controls. Also, radiation worker training and skill levels were reviewed to determine if they were sufficient relative to the radiological hazards and the work involved. Documents reviewed were listed in the Attachment.

This inspection supplements the sample reported in Inspection Report 05000454/2008002; 05000455/2008002.

b. Findings

No findings of significance were identified.

4OA1 Performance Indicator Verification (71151)

.1 Mitigating Systems Performance Index - Emergency AC Power System

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index (MSPI) – Unit 1 and Unit 2 Emergency AC Power System performance indicator for Byron Unit 1 and Unit 2 for the period from the fourth quarter 2007 through the third quarter 2008. To determine the accuracy of the Performance Indicators (PI) data reported during those periods, PI definitions and guidance contained in the Nuclear

Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's operator narrative logs, MSPI derivation reports, issue reports, event reports, and NRC Integrated Inspection Reports for the period of October 2007 through September 2008 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two MSPI emergency AC power system samples as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

.2 Mitigating Systems Performance Index - High Pressure Injection Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index – Unit 1 and Unit 2 High Pressure Injection Systems performance indicator for Byron Unit 1 and Unit 2 for the period from the fourth quarter 2007 through the third quarter 2008. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, MSPI derivation reports, event reports, and NRC Integrated Inspection Reports for the period of October 2007 to September 2008 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two MSPI high pressure injection system samples as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

.3 Mitigating Systems Performance Index - Heat Removal System

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index – Unit 1 and Unit 2 Heat Removal System performance indicator for Byron Unit 1 and Unit 2 for the period from the fourth quarter 2007 through the third quarter 2008. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 5, were used. The inspectors reviewed the licensee’s operator narrative logs, issue reports, event reports, MSPI derivation reports, and NRC Integrated Inspection Reports for the period of October 2007 through September 2008 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two MSPI heat removal system samples as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

.4 Mitigating Systems Performance Index - Residual Heat Removal System

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index – Unit 1 and Unit 2 Residual Heat Removal System performance indicator for Byron Unit 1 and Unit 2 for the period from the fourth quarter 2007 through the third quarter 2008. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 5, were used. The inspectors reviewed the licensee’s operator narrative logs, issue reports, MSPI derivation reports, event reports, and NRC Integrated Inspection Reports for the period of October 2007 through September 2008 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two MSPI residual heat removal system samples as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

.5 Mitigating Systems Performance Index - Cooling Water Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the Unit 1 and Unit 2 Mitigating Systems Performance Index – Unit 1 and Unit 2 Cooling Water Systems performance indicator for Byron Unit 1 and Unit 2 for the period from the fourth quarter 2007 through the third quarter 2008. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 5, were used. The inspectors reviewed the licensee’s operator narrative logs, issue reports, MSPI derivation reports, event reports, and NRC Integrated Inspection Reports for the period of October 2007 through September 2008 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two MSPI cooling water system samples as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

.6 Reactor Coolant System Specific Activity

a. Inspection Scope

The inspectors sampled licensee submittals for the Reactor Coolant System (RCS) Specific Activity performance indicator for the period of June 2007 through August 2008 to determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 5, were used. The inspectors reviewed the licensee’s RCS chemistry samples, TS requirements, issue reports, event reports and NRC Integrated Inspection Reports for the period of June 2007 through August 2008 to validate the accuracy of the submittals. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. In addition to record reviews, the inspectors observed a chemistry technician obtain and analyze a reactor coolant system sample. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two reactor coolant system specific activity samples as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

.7 Reactor Coolant System Leakage

a. Inspection Scope

The inspectors sampled licensee submittals for the RCS Leakage performance indicator Unit 1 Reactor Coolant System Identified Leakage and Unit 2 Reactor Coolant System Identified Leakage. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's operator logs, RCS leakage tracking data, issue reports, event reports, and NRC Integrated Inspection Reports for the period of March 2007 to November 2008 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two reactor coolant system leakage samples as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

.8 Radiological Effluent TS/Offsite Dose Calculation Manual Radiological Effluent Occurrences

a. Inspection Scope

The inspectors sampled licensee submittals for the Radiological Effluent TS (RETS)/Offsite Dose Calculation Manual (ODCM) Radiological Effluent Occurrences performance indicator for the period of June 2007 through August 2008. The inspectors used PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5 to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee's issue report database and selected individual reports generated since this indicator was last reviewed to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. The inspectors reviewed gaseous effluent summary data and the results of associated offsite dose calculations for selected dates between June 2007 and August 2008 to determine if indicator results were accurately reported. The inspectors also reviewed the licensee's methods for quantifying gaseous and liquid effluents and determining effluent dose. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one RETS/ODCM radiological effluent occurrences sample as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Physical Protection

.1 Routine Review of items Entered Into the Corrective Action Program

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's CAP at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Attributes reviewed included: the complete and accurate identification of the problem; that timeliness was commensurate with the safety significance; that evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent of condition reviews, and previous occurrences reviews were proper and adequate; and that the classification, prioritization, focus, and timeliness of corrective actions were commensurate with safety and sufficient to prevent recurrence of the issue. Minor issues entered into the licensee's CAP as a result of the inspectors' observations are included in the attached List of Documents Reviewed.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure they were considered an integral part of the inspections performed during the quarter and documented in Section 1 of this report.

b. Findings

No findings of significance were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's CAP. This review was accomplished through inspection of the station's daily condition report packages.

These daily reviews were performed by procedure as part of the inspectors' daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings of significance were identified.

.3 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment issues, but also considered the results of daily inspector CAP item screening discussed in Section 4OA2.2 above, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the 6 month period of July 01 through December 31, 2008, although some examples expanded beyond those dates when the scope of the trend warranted.

The review also included issues documented outside the normal CAP in major equipment problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self assessment reports, and Maintenance Rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's CAP trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

This review constituted a single semi-annual trend inspection sample as defined in IP 71152-05.

b. Findings

No findings of significance were identified.

.4 Selected Issue Follow-Up Inspection: Byron Review of Potential Preconditioning Issue

a. Inspection Scope

During a review of items entered in the licensee's CAP, the inspectors observed that the licensee was following up on potential preconditioning issues identified at Braidwood for applicability to Byron Station. The inspectors selected this issue for a follow-up inspection on problem identification and resolution. Documents reviewed are listed in the Attachment to this report.

This review constituted one in-depth problem identification and resolution sample as defined in IP 71152-05.

b. Findings and Observations

In October 2007, the licensee at Braidwood identified a number of potential preconditioning issues of motor-operated and air-operated valves. Specifically, preventive maintenance tasks were being performed on the valves prior to the inservice test such that testing was not being conducted in the as-found condition. Although the

ASME Code does not specifically require as-found testing, the NRC had issued several generic communications on the subject to ensure licensees evaluated the potential affects of the maintenance on the test results. An action request was initiated to review this issue for applicability to Byron.

In December 2007, the licensee's corporate support group, the licensee and its sister sites discussed this issue and developed draft guidance on preconditioning. One area that was considered to be potentially preconditioning was performing stem lubrications on a valve on the same frequency as the inservice test.

In February 2008, in advance of refueling outage B1R15, the licensee conducted a review of valves that were tested on a cold shutdown or refueling outage frequency. The review was performed to determine whether any preventive maintenance was going to be performed prior to the inservice test on the valve, which could be presumed to be preconditioning. This review did not identify any instances of preconditioning. The inspectors, however, questioned six valves that had stem lubrication frequency of once a refueling cycle and appeared to be performed on the valves prior to the test. This did not appear to meet the licensee's guidance in Procedure ER-AA-302-1006, "Generic Letter 96-05 Program Motor-Operated Valve Maintenance and Testing Guidelines," or the newly developed draft guidance for what could be potentially considered preconditioning. The guidance stated that stem lubrication would not be considered preconditioning unless it was routinely scheduled immediately before and at the same frequency as the valve test. These six valves appeared to meet the guidance for being potentially preconditioning issues.

Although the inspectors determined that these valves should have been flagged in the action request as having potential preconditioning concerns, further review by the licensee indicated that with the exception of one valve, all the stem lubrications were performed after the inservice test during the outage. The one exception also had several other maintenance activities performed during the outage and it was not conclusive if the testing was performed prior to or after the maintenance. The licensee indicated that there was not any guidance with respect to the schedule as to whether testing or maintenance should be performed first. The issue of preconditioning of motor-operated valves prior to their diagnostic test to meet Generic Letter 96-05, "Periodic Verification of Design-Basis Capability of Safety-Related Power-Operated Valves," may also be an issue as it may not be possible to verify the valve would have been capable to operate under design basis conditions for the time frame since the last maintenance or test without the as-found testing. Although no specific preconditioning issues were identified, additional scheduling guidance or training may be warranted to highlight the potential for preconditioning by not testing valves in their as-found condition.

No findings of significance were identified.

.5 4OA5 Other Activities Implementation of Temporary Instruction (TI) 2515/176, "Emergency Diesel Generator Technical Specification Surveillance Requirements Regarding Endurance and Margin Testing"

a. Inspection Scope

The objective of TI 2515/176 was to gather information to assess the adequacy of nuclear power plant emergency diesel generator endurance and margin testing as prescribed in plant-specific TS. The inspectors reviewed the licensee's TS, procedures,

and calculations, and interviewed licensee personnel to complete the TI. The information gathered for this TI was forwarded to the Office of Nuclear Reactor Regulation for further review and evaluation on December 17, 2008. This TI is complete at Byron Station; however, this TI 2515/176 will not expire until August 31, 2009. Additional information may be required after review by the Office of Nuclear Reactor Regulation.

b. Findings

No findings of significance were identified.

.6 Institute of Nuclear Power Operations (INPO) Plant Assessment Report Review

a. Inspection Scope

The inspectors reviewed the final report for the INPO plant assessment conducted in June 2008 and dated December 2008. The inspectors reviewed the report to ensure that issues identified were consistent with the NRC perspectives of licensee performance and to verify if any significant safety issues were identified that required further NRC follow-up.

b. Findings

No findings of significance were identified.

.7 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

- Multiple tours of operations within the Central and Secondary Security Alarm Stations;
- Owner Controlled Area and Protected Area access control posts;
- Other security officer posts including the ready room and compensatory posts; and Security equipment log review.

The inspectors also reviewed a report of the results of a survey of the site security organization relative to its safety conscious work environment. The inspectors considered whether the surveys were conducted in a manner that encouraged candid and honest feedback. The results were reviewed to determine whether an adequate number of staff responded to the survey. The inspectors also reviewed Exelon's self-assessment of the survey results and verified that any issues or areas for improvement were entered into the corrective action program for resolution.

These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status review and inspection activities.

b. Findings

No findings of significance were identified.

.8 (Closed) Unresolved Items (URI) 05000454/455/2008003-06: Auxiliary Feedwater Tunnel Hatch Margin to Safety

The licensee had identified that the design analysis for evaluation of the Auxiliary Feedwater (AFW) tunnel flood seal covers did not include the effects of a high energy line break in the main steam isolation valve tunnels at another facility. The NRC inspectors at that facility questioned why a dynamic load factor as a result of the impulse pressure following a high energy line break had not been considered in an analytic calculation performed to support the operability evaluation.

Following a review of the licensee's evaluation, the inspectors questioned the licensee's conclusion that the operability of the AFW hatches continued to be supported despite analytical results showing a factor of safety for the concrete expansion anchors supporting the hatches of less than 2.0, which is contrary to the guidance provided in NRC Bulletin 79-02, "Pipe Support Base Plate Designs Using Concrete Expansion Anchors." Additionally, the inspectors noted that the licensee's evaluation did not address Section C.13 of NRC Technical Guidance 9900, "Operability Determinations & Functionality Assessment for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety." Specifically, Section C.13 stated that if a structure was degraded, the licensee should assess the structure's capability of performing its specified function. As long as the identified degradation did not result in exceeding acceptance limits specified in applicable design codes and standards referenced in the design basis documents, the affected structure was either operable or functional. The licensee also identified additional errors that reduced the margin of safety for the structural integrity of a high energy line break barrier.

At the close of the inspection period that opened this URI, temporary modifications were implemented at both facilities that restored the margin of safety to greater than 2.0. Pending additional follow-up by the inspectors for the past operability and timeliness of corrective actions, extent of condition, and corrective actions, a URI was opened.

During this inspection period, the issue was assessed by regional inspectors at the other facility. The inspectors' conclusions were reviewed by the inspectors at Byron and confirmed to be applicable to Byron. The inspectors documented their review in Section 4OA7 as two licensee-identified violations. This URI is closed.

4OA6 Management Meetings

.1 Exit Meeting Summary

On January 15, 2009, the inspectors presented the inspection results to Mr. D. Hoots and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the material examined during the inspection was proprietary.

.2 Interim Exit Meetings

Interim exits were conducted for:

- Occupational Radiation Safety Program for Access to Radiologically Significant Areas and Performance Indicator Verification with Mr. D. Hoots, and other members of the licensee's staff on October 10, 2008.
- Inservice Inspection 71111.08 with Mr. D. Hoots on October 16, 2008. The inspectors returned proprietary information reviewed during the inspection prior to leaving the site.
- TI 2515/176 via telephone with Mr. B. Grundmann and other licensee staff on November 25, 2008.
- The licensed operator requalification training written examination and operating test construction and the biennial written examination and annual operating test results with Mr. G. Wolfe via telephone on December 15, 2008.

The inspectors confirmed that none of the potential report input discussed was considered proprietary.

4OA7 Licensee-Identified Violations

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

- NRC Order EA-03-009, for Byron Unit 2, requires that the licensee perform ultrasonic testing of each RPV head penetration nozzle every refueling outage because of its high susceptibility ranking. Contrary to this, the licensee discovered during the current B2R14 outage that penetration 41 was not ultrasonically tested during the prior Unit 2 outage in April 2007 (B2R13). No observable boric acid deposits were noted as a result of the bare metal visual examination of the penetration nozzles performed during outages B2R13 and B2R14; and there were no reportable indications found as a result of the B2R14 ultrasonic test of penetration 41. Based upon this, the violation was of very low safety significance. The licensee entered this issue into the corrective action program as IR 829647.
- 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected. Licensee Procedure LS-AA-125, Revision 12, "Corrective Action Program (CAP) Procedure," was written in accordance with Criterion XVI. Step 2.12 of LS-AA-125 requires, in part, "...a Corrective Action is any action that meets any of the following.... Is necessary to restore a Significance Level 1, 2, or 3 Condition...." Contrary to the above, on October 22, 2008, licensee personnel failed to correct a condition adverse to quality as stated in IR 834410. Specifically, loose debris that had been left on the polar crane had not been removed prior to Unit 2 changing from Mode 5 to Mode 4. IR 834410 had been designated by the licensee as a Significance level 3 condition. This issue is of very low safety significance because this finding was not a design or qualification deficiency, did not result in loss of system or train safety function and was not safety significant due to external events.

- 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected. Contrary to the above, since April 18, 2007, the licensee failed to promptly identify and correct conditions adverse to quality regarding design of AFW tunnel hatch covers. Specifically, upon finding a design deficiency in the hatch structural calculation, the licensee failed to promptly identify all the related design issues through more detailed reviews and field inspections, and to complete corrective actions to address the design deficiencies and to restore the design margins. This finding was of very low safety significance because the finding did not represent an actual open pathway in the physical integrity of reactor containment. The issue was identified in the licensee's CAP as IR 857487. The licensee had completed a temporary modification to increase the safety margin of the hatches and is in the process of designing a permanent modification to restore full design margin.
- 10 CFR Part 50, Appendix B, Criterion III, "Design Control," required, in part, that design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculation methods, or by the performance of a suitable testing program. Contrary to this, on December 4, 1987, the licensee failed to ensure design measures were in place for verifying or checking the adequacy of AFW hatch cover plate design. Specifically, in Calculation 5.6.3.9, the licensee failed to ensure that a safety factor in accordance with the station design criteria was applied in the design of expansion anchors. The issue was identified in the licensee's corrective action as IR 654270. This finding was of very low safety significance because it did not represent an actual open pathway in the physical integrity of reactor containment.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

D. Hoots, Site Vice President
W. Grundmann, Regulatory Assurance Manager
Z. Cox, Chemist
G. Contrady, Programs Manager
H. Do, Corporate ISI Engineer
S. Greenlee, Engineering Director
D. Thompson, Radiation Protection Manager

Nuclear Regulatory Commission

R. Skokowski, Branch Chief

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000454/2008005-01 05000455/2008005-01	NCV	Failure to Remove or Evaluate Loose Debris Inside of Containment Prior to Applicable Mode
05000454/2008005-02 05000455/2008005-02	NCV	Failure to Evaluate Radiological Hazards for Airborne Radioactivity

Closed

05000454/2008005-01 05000455/2008005-01	NCV	Failure to Remove or Evaluate Loose Debris Inside of Containment Prior to Applicable Mode
05000454/2008005-02 05000455/2008005-02	NCV	Failure to Evaluate Radiological Hazards for Airborne Radioactivity
05000454; 455/2008-003-06	URI	Unit 1 and Unit 2 Auxiliary Feedwater Tunnel Hatch Margin to Safety

LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety, but rather, that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

Section 1R01: Adverse Weather Protection

WO 1020141 01; 89-13 Heat Exchanger Inspection for 2B Diesel Driven AF Pump Closed Cycle Cooler, October 16, 2008
Issue 846625; Procedure Enhancement, November 18, 2008
BOP SX-T2; SX Tower Operations Guidelines, Revision 12

Section 1R04: Equipment Alignment (Quarterly)

2BOSR 7.8.1-1; Unit 2 Essential Service Water System Valve Position Monthly Surveillance, Revision 16
BOP DG-1; Diesel Generator Alignment to Standby Condition, Revision 11
BOP VD-5; DG Room Ventilation System Operation, Revision 6
BwOP VD-5; DG Room Ventilation System operation, Revision 12
BwOS VD-1a; Diesel Ventilation Systems; Revision 4
10 CFR 50.59 Screening, BOP Vd-5 DG Room Ventilation System Operation; January 06, 1986

Corrective Action Documents as a Result of NRC Inspection

IR 852537; Compensatory Actions Not Procedurally Directed, December 4, 2008

Section 1R05: Fire Protection (Quarterly)

Corrective Action Documents as a Result of NRC Inspection

IR 842026; Fire Zone Walkdown Issues, November 07, 2008
IR 850920; Interim NRC Inspector Fire Zone Walkdown Findings, November 20, 2008
IR 850922; Interim NRC Inspector Fire Zone Walkdown Findings, November 20, 2008
IR 850925; Interim NRC Inspector Fire Zone Walkdown Findings, November 20, 2008
IR 850926; Interim NRC Inspector Fire Zone Walkdown Findings, November 20, 2008
IR 850929; Interim NRC Inspector Fire Zone Walkdown Findings, November 20, 2008
IR 850931; Interim NRC Inspector Fire Zone Walkdown Findings, November 20, 2008
IR 850932; Interim NRC Inspector Fire Zone Walkdown Findings, November 20, 2008
IR 842026; Fire Zone Walkdown Issues, November 07, 2008
IR 847572; Interim NRC Inspector Fire Zone Walkdown Findings, November 20, 2008

Section 1R05: Fire Protection (Annual)

BAP 1100-10; Response Procedure for Fire, Revision 7
BAP 1100-10T1; 401' Fire Brigade Equipment Inventory, Revision 7
Byron Emergency Self-Contained Breathing Apparatus Storage Locations Monthly Inventory, September 2008
OP-AA-201-003; Fire Drill Performance, Revision 7

OP-AA-201-005; Fire Brigade Qualification, Revision 6
OP-AA-201-008; Pre-Fire Plans, Revision 1
RP-BY-1000; Maintenance Care and Inspection of the ISI Viking Self-Contained Breathing Apparatus (SCBA), Revision 9
Self-Contained Breathing Apparatus Monthly Inspection, September 2008
Byron Station Fire Drill Critique Form, August 24, 2008
Summary Report for Each Shift Reflecting Fire Brigade and HazMat Qualification Status, October 12, 2008
IR 823253; Safe-Guards Information Slows Fire Response, September 27, 2008

Section 1R07: Heat Sink Performance

WO 1036955; Perform As-Found/As-Left Inspections of 2C RCFC
Issue 830146; Replace RCFC Channel Heads with stainless Steel in B2R15, October 13, 2008
IR 830370; Restricted Tubes in 2C RCFC, Need to Plug, October 13, 2008
IR 829315; 2C RCFC Channel Head Degradation, Divider Plates, October 10, 2008

Section 1R08: Inservice Inspection Activities

IR 829647; Penetration 41 Not Examined During B2R13; October 11, 2008
IR 831084; Foreign Objects Found In 2C SG Secondary Side - B2R14; October 15, 2008
IR 829610; Acceptance Criteria Used On SX Pipe Was Not Appropriate; October 11, 2008
IR 843635, Steam Generator Tube Sheet Inspection Results - B2R14, November 11, 2008
IR 832181; Foreign Objects Found In 2A SG Secondary - B2R14; dated October 17, 2008
IR 830452; B2R14 - Weld Defects Revealed During Radiography Of Repair; October 14, 2008
IT00717275-02; Buildup of Deposits in Steam Generators, NRC IN 2007-37
ER-AP-335-1012; Bare Metal Visual Examination of PWR Vessel Penetration and Nozzle Safe-Ends; Revision 3
ER-AP-335-040; Evaluation of Eddy Current Data for Steam Generator Tubing; Revision 4
EXE-ISI-11; Liquid Penetrant Examination, Revision 4
EXE-UT-350; Procedure for Acquiring Material Thickness and Weld Contours; Revision 2
EXE-PDI-UT-2; Ultrasonic Examination of Austenitic Piping Welds in Accordance with PDI-UT-2; Revision 5
EXAE-ISI-8; VT-1 Direct; Revision 1
ER-AP-335-039; Multi-Frequency Eddy Current Data Acquisition of Steam Generator Tubing; Revision 5
ER-MW-335-1009; Site Specific Performance; Revision 4
ER-AP-331; Boric Acid Corrosion Control (BACC) Program; Revision 3
ER-AP-331-1001; Boric Acid Corrosion control (BACC) Inspection Locations, Implementation and Inspection Guidelines; Revision 3
ER-AP-331-1002; Boric Acid Corrosion control Program Identification, Screening, and Evaluation; Revision 4
ER-AP-331-1004; Boric Acid Corrosion Control (BACC) Training and Qualification, Revision 2
ER-AP-420-002; Byron/Braidwood Unit 2: Steam Generator Eddy Current Activities; Revision 8

Section 1R11: Licensed Operator Regualification Program

Six Reactor Operator Biennial Written Examinations for CY 2008; no dates
Thirty Senior Reactor Operator Examination Questions for CY 2008 Exams; no dates
Twelve Dynamic Simulator Scenarios; no dates

48 Job Performance Measures; no dates

Licensed Operator Written Examination and Operating Test Results, CY 2008; no date

Section 1R12: Maintenance Effectiveness

IR 417274; Hydramotor Indication Shows Open but Damper Blades are Closed, March 11, 2002

IR 460411; VA Supply/Exhaust Fan Vibration Alarm Setpoint Basis Concern

IR 717005; VA-Tolerance for Equipment Degradation, January 1, 2008

IR 726481; High Vibrations on OC VA Fan (Supply Fan), January 24, 2008

IR 727128; VA Issues, January 26, 2008

IR 735812; VA Concerns, February 13, 2001

IR 748406; Need (A)(1) Determination: VA Unacceptable Performance Trend, March 12, 2008

IR 850742; Control Damper Problems for 1A DG Ventilation, December 01, 2008

IR 869580; MM Expanded Scope Replace Linear Converter, January 23, 2007

IR 999934; Replace Linear Converter, November 07, 2008

WO 99270872; 1A DG Vent Outside Damp Not Fully Closed, September 13, 2008

VA Degradation/Status Presentations to the Plant Health Committee, December 10, 2007, February 4, 2008, and May 5, 2008

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Unit 1 Risk Configurations; Week of October 13, 2008, Revision 3

Unit 2 Risk Configurations; Week of November 17, 2008

Protected Equipment Log for 2B DG Outage, October 11, 2008

Protected Equipment Log for Line 0622/Bus 12 Outage, October 12, 2008

Protected Equipment Log for Unit 0 Component Cooling Water Heat Exchanger, October 11, 2008

Protected Equipment Log for Unit 2 CC Heat Exchanger, November 16, 2008

Protected Equipment Log for 2RA RH Pump Suction OOS, November 17, 2008

B2R14 Shutdown Risk Evaluation; October 15, 2008

B2R14 Outage Status, October 16, 2008

Byron Operations Log; October 15, 2008, to October 16, 2008

OU-AP-104; Shutdown Safety Management Program Byron/Braidwood Annex, Revision 11

IR 832167; NOS Identified OPS Lacks Sensitivity to OLR/SDR, October 17, 2008

Unit 0/1/2 Standing Order; Operator Ownership During IMD Surveillances, October 17, 2008

IR 829481; NOS ID Shutdown Risk Vulnerability, October 10, 2008

Section 1R15: Operability Evaluations

IR 810117; Unit 1 LM Indicates Potential Source of Noise as Near 1RC8002D, August 22, 2008

IR 810867; Expansion Tank Overflow When Started and Running, August 26, 2008

IR 814019; Low JW Level in the 1B AF Pump, September 04, 2008

IR 846398; Need Work Order Created to Replace Grease, November 18, 2008

IR 846420; 2SI8811A; Motor Found Degraded Per Inspection Criteria, November 18, 2008

EC 366163; Operations Evaluation 07-005, Unventable Gas Voids in Containment Recirculation Sump Piping, November 20, 2008

EC 371879; Operations Evaluation 08-007, Gas Void at 2CS009A, November 20, 2008

EC 371965; Operations Evaluation 08-008, 2B AF Pump Jacket Water Overflow, Revision 000

EC 373393; Operations Evaluation 08-010, 1B DG Cylinder and Head Indications, December 18, 2008

Fluid Analysis Report; Unit 2 AF Cooler, September 24, 2008

Operational and Technical Decision Making 2008 – 2009; Suspect 1RC8002D Valve guide(s) Not Properly Retained in Valve Body
Adverse Condition Monitoring and Contingency Plan; Unit 1 Loose Parts Monitoring System (LPMS) Noise, August 26, 2008
CAE-02-31 Westinghouse Letter; LSIV Loose Parts 50.59 Screen EVAL-02-062, Revision 1, March 21, 2002
WO 1072112 02; MOV PM, Actuator Inspection, Diagnostic testing, November 18, 2008

Section 1R18: Plant Modifications

IR 842362; 2CV181 “2A RCP Standpipe PW Supply Valve” Failed to Close, November 08, 2008
IR 843783; Unexpected Alarm, November 12, 2008
IR 846404; Revised Bars for TCP 373002 are Incorrect, November 18, 2008
EC 373002; Installation of Temporary Line to Connect the Drain Lines of RCP Standpipes 2A and 2D, Revision 0
EC 371360; Install Vent Valve on 2SI05CA-8, Revision 2
EC 373224; Provide Temporary Fans for 1A DG Room, Revision 0
WO 01149077; Install Vent Valve on 2SI05CA-8, October 18, 2008
WO 01149077 13; SEP PMT: VT-2 of 2SI130, October 15, 2008
WO 01149077 14; OP PMT: Verify No Seat leakage on 2SI130, October 15, 2008
WO 01149077 15; SEP PMT: Record Vibe Data 2SI130 at Full Flow Conditions, October 15, 2008

Section 1R19: Post Maintenance Testing

1BOSR 3.2.8-610B; Unit 1 ESFAS Instrumentation Slave Relay Surveillance and Automatic Actuation Test (Train B Automatic Safety Injection – K610), Revision 2
2BOSR 7.5.5-2; Unit 2 Train B Auxiliary Feedwater Valve Emergency Actuation Signal Verification Test, Revision 4
WO 999110; 1AP12E-A Relay #1-RCF2 for 1VP01CB Operations PMT Partial 1BOSR 3.2.8-610B, November 25, 2008
2BOSR 3.2.8-632A; ESFAS Instrumentation Slave Relay Surveillance (Train A Auxiliary Feedwater Actuation – Relays k632, K639, Revision 2
WO 1165207 01; MM-Repair of 2SI8818C During B2R14
WO 1165207 04; EP – Perform Visual Examination of Disassembled Check Valve
WO 1165207 06; Operations PMT – 2SI8818C SLT Per 2BOSR 4.14.1-1
WO 1165207 07; Operations PMT - 2SI8818C CO Per 2BOSR 5.5.8RH.2-2
WO 1020023 01; 2RH25 VT-2 Exam, October 15, 2008
ASME Section XI Repair/Replacement Plan; 2SI8818C (Loop 3 Cold Leg Accumulation Injection Check Valve, September 29, 2008
BOP CV-19; Switching Charging Pumps, Revision 14
1BOSR 5.5.1-1; Unit 1 RCS Seal Injection Flow Verification Monthly Surveillance, Revision 4
2BVSR 5.c.2-1; Unit 2 Charging/Safety Injection System Flow Balance, Revision 4

Section 1R20: Refueling and Outage Activities

Ultrasonic Thickness Calibration Data Sheet; Report Number 2008-707
IR 826879; Calibrate/Repair 2FI-0928A, October 05, 2008
IR 834405; Need B2R15 W/O to Retrieve Rag and Wire From Upender Pit
B2R14 Work Orders Added to Date, October 15, 2008

List of Work Orders Removed from B2R14 via SCARF Process as of 7:00 am on October 16, 2008

1BGP 100-2; Plant Startup, Revision 37
1BGP 100-2A1; Reactor Startup, Revision 26
1BGP 100-2TI; Plant Startup Flowchart, Revision 10
1BGP 100-2T3; Reactor Startup Flowchart, Revision 5
1BGP 100-4; Power Descension, Revision 36
1BGP 100-4T1; Power Descension Flowchart, Revision 11
1BGP 100-5; Plant Shutdown and Cooldown, Revision 53
1BGP 100-5TI; Plant Shutdown and Cooldown Flowchart, Revision 26
BOP RH-6; Operation of the RH System in Shutdown Cooling, Revision 36
BOP RH-8; Filling the Refueling Cavity for Refueling, Revision 18
BOP RH-9; Pump Down of the Refueling Cavity to the RWST, Revision 24
ALM Corporation Material Handling Platform Lift Manual
BAP 1450-1; Access to Containment, Revision 37
2BOSR Z.5.B.1-1; Containment Loose Debris Inspection, Revision 0
Issue 834555; B2R14 Reactor Cavity Hoist Cable Ties, October 22, 2008
LS-AA-125; Corrective Action Program Procedure, Revision 12
IR 833539; White Plastic Cable Tie Not Immediately Retrievable, October 20, 2008
IR 834002; Foreign Material in 2B ECCS Recirculation Sump, October 21, 2008
IR 834087; Loose Debris Walkdown Items Requiring Disposition, October 21, 2008
IR 835427; B2R14 LL – Weakness in Control of Material Left in Containment, October 23, 2008
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IR 833612; Inactive Boric Acid Leak on 2SI8822C, October 20, 2008
IR 833613; Inactive Boric Acid Leak on 2SI8810C, October 20, 2008
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IR 834410; B2R14 NRC Mode 3 Containment Walkdown Identified Items, October 22, 2008
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Section 1R22: Surveillance Testing

1BOSR 6.1.1-11; Primary Containment Type C Local Leakage Rate Tests and IST Tests of Pressurizer Relief System “Partial for 1RY8028”, Revision 7
2BOSR 7.5.4-2; Unit 2 Diesel Driven Auxiliary Feedwater Pump Monthly Surveillance, Revision 16
2BOSR 7.5.5-2; Unit 2 Train B Auxiliary Feedwater Valve Verification Test, Revision 4
2BOSR 8.1.2-1; Unit 2 A Diesel Generator Operability Surveillance, Revision 21
2BVSR 5.c.2-1; Unit 2 Charging/Safety Injection System Flow Balance, Revision 4
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BOP DG-11; Diesel Generator Startup, Revision 20
BOP DG-12; Diesel Generator Shutdown, Revision 19

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IR 841953; IST Basis Documents for 1/2SI8818A-D Need Updating, November 06, 2008
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Section 20S1: Access Control to Radiologically Significant Areas

RP-AA-460; Controls for High Radiation and Locked High Radiation Areas; Revision 17
RP-AA-460-001; Controls for Very High Radiation Areas; Revision 1
RP-AA-460; Access to Reactor Incore Sump Area; Revision 2
RP- BY-500-1003; Radiological Controls for Handling Items and Hanging Activated Parts in the Spent Fuel Pool
Radiation Work Permit and Associated ALARA Reviews; RWP 10008926; B2R14 Seal Table – Rack Disconnect/Maintenance/Eddy Current/Restoration
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IR 795311; RWP Violations (PC Requirements); dated July 10, 2008
IR 761294; Level 1 Personal Contamination Event; dated 9, 2008
IR 756342; Worker Entered A/D Platform without Electronic Dosimeter; dated March 29, 2008
IR 754696; Worker Locked Out of RCA – Rad Worker Behavior; dated March 26, 2008
IR 756136; PCE: B1R15 Personal Contamination Event; dated March 28, 2008
IR 673712; RP Not Effectively Using Corrective Action Program; dated September 20, 2007
IR 755986; Alpha Survey Documentation Gaps; dated March 27, 2008
IR 756296; RP-AA-460-1001; Not Completed in Timely Manner; dated March 28, 2008
IR 812338; Ni-63 Source Leak Tests Exceed 6-Month Surveillance Frequency; dated August 22, 2008

Section 1EP6: Drill Evaluation

IR 844467; OSC Minimum Staffing Not Met for Crew D in Drill, November 13, 2008
Byron 2008 Drive-In Drill; Scenario Information
Nuclear Accident Reporting System (NARS) Form; Utility Message No. 2, November 12, 2008
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Section 40A1: Performance Indicator Verification

LS-AA-2090; Monthly Data Elements for NRC Reactor Coolant System (RCS) Specific Activity; dated July 3, 2007 through September 2, 2008
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MSPI Derivation Report; Unit 1 and Unit 2 High Pressure Injection System Unavailability and Unreliability Index, February 2008
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Section 4OA2: Identification and Resolution of Problems

IR 642107; IST Program Implementation, June 19, 2007
IR 678543; Possible Pre-Conditioning Issue – IST Testing, October 1, 2007
IR 686518; Byron Review of Braidwood Potential Pre-Conditioning Issue, October 18, 2007
ER-AA-302-1006; Generic Letter 96-05 Program Motor-Operated Valve Maintenance and Testing Guidelines, Revision 7

Section 4OA5: Other Activities

1BOSR 8.1.14-1; Unit 1A Diesel Generator 24 Hour Endurance Run, Revision 10
1BOSR 8.1.14-2; Unit 1B Diesel Generator 24 Hour Endurance Run, Revision 8
2BOSR 8.1.14-1; Unit 2A Diesel Generator 24 Hour Endurance Run, Revision 10
2BOSR 8.1.14-2; Unit 2B Diesel Generator 24 Hour Endurance Run, Revision 10
Calculation 19-T-5; Diesel Generator Loading During LOOP/LOCA, Revision 6

LIST OF ACRONYMS USED

AFW	Auxiliary Feedwater System
ALARA	As Low As Reasonably Achievable
CAP	Corrective Action Program
CFR	Code of Federal Regulations
JPM	Job Performance Measure
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Inspection Report
IR	Issue Report
IST	Inservice Testing
LORT	Licensed Operator Requalification Training
MSPI	Mitigating Systems Performance Index
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
OOS	Out of Service
ODCM	Offsite Dose Calculation Manual
OSP	Outage Safety Plan
PI	Performance Indicator
RCFC	Reactor Containment Fan Cooler
RCS	Reactor Coolant System
RETS	Radiological Effluent Technical Specifications
RWP	Radiation Work Permit
SDP	Significance Determination Process
TI	Temporary Instructions
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
WO	Work Order