UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, IL 60532-4352

November 13, 2008

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

SUBJECT: BYRON STATION, UNITS 1 AND 2 INTEGRATED INSPECTION REPORT 05000454/2008-004; 05000455/2008-004

Dear Mr. Pardee:

On September 30, 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 October 10, 2008, 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 and one self-revealed findings of very low safety significance were identified. Two of these findings involved a violation 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.

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 and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

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

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

Enclosure: Inspection Report 05000454/2008-004; 05000455/2008-004
w/Attachment: Supplemental Information

cc w/encl: Site Vice President - Byron Station
Plant Manager - Byron Station
Regulatory Assurance Manager - Byron Station
Chief Operating Officer and Senior Vice President
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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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
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Illinois Emergency Management Agency
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Letter to C. Pardee from R. Skokowski dated November 13, 2008

SUBJECT: BYRON STATION, UNITS 1 AND 2 INTEGRATED INSPECTION REPORT 05000454/2008-004; 05000455/2008-004

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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:	05000454/2008-004 and 05000455/2008-004
Licensee:	Exelon Generation Company, LLC
Facility:	Byron Station, Units 1 and 2
Location:	Byron, Illinois
Dates:	July 01, 2008, through September 30, 2008
Inspectors:	B. Bartlett, Senior Resident Inspector R. Ng, Resident Inspector D. McNeil, Operator License Examiner R. Walton, Operator License Examiner C. Thompson, Resident Inspector, Illinois Department of Emergency Management
Observer:	J. Gilliam, Reactor Engineer
Approved by:	R. Skokowski, Chief Reactor Projects Branch 3 Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000454/2008004; 05000455/2008004; July 1, 2008 – September 30, 2008; Byron Station, Units 1 and 2; Fire Protection; Maintenance Effectiveness; Operability Evaluation.

This report covers a three-month period of inspection by resident inspectors and an announced baseline inspection by the regional operator license examiners. Three Green findings were identified by the inspectors. Two 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-Revealing Findings

Cornerstone: Initiating Events

- Green. A finding of very low safety significance and an associated Non-Cited Violation (NCV) of Byron Unit 1 Operating License Condition 2.C (6) and Byron Unit 2 Operating License Condition 2.E was identified for the licensee's failure to obtain NRC approval before making changes to the fire protection program. Specifically, the licensee isolated the manual carbon dioxide (CO_2) suppression system to the upper cable spreading rooms (UCSR) without prior NRC approval. The licensee entered this issue in the corrective action program and implemented compensatory action to verify detection system operability. In addition the licensee plans to submit a license change request associated with the removal of CO_2 suppression from the UCSR.

  The finding was determined to be more than minor because the inspectors could not reasonably determine that the isolation would not have ultimately required NRC prior approval. The inspectors determined this finding to be of very low safety significance (Green) based on a Phase 2 SDP evaluation. This finding is related to the cross-cutting area of Human Performance for failure to use conservative assumptions in decision making and to adopt a requirement that demonstrates the proposed action is safe in order to proceed with respect to reviewing the plant design and license basis. (H.1(b)) (Section 1R05.1.b)

- Green. A finding of very low safety significance was self-revealed when the Unit 2 Train B (2B) station air compressor (SAC) tripped on two separate occasions due to inadequate preventive maintenance (PM). The license entered this issue into the corrective action program, replaced the failed components, and returned the SAC to service. The licensee is currently reassessing the SAC PM program. This finding was determined not to be a violation of NRC requirements.

  The finding is greater than minor because, if left uncorrected, the issue would have become a more significant safety concern. The inspectors completed a Phase 2 SDP evaluation using the Byron risk-informed inspection notebook and determined that this issue is of very low safety significance (Green) at 1E-7. The inspectors determined that this finding was related to the cross-cutting component of Human Performance for

Resources (H.2.(a)) as the licensee did not minimize PM deferrals to ensure that equipment were available and adequate to assure nuclear safety. (Section 1R12.1.b)

Cornerstone: Mitigating Systems

- Green. 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 the Adverse Condition Monitoring Plan for safety injection system check valve leakage. Specifically, the licensee failed to vent the safety injection line every three days as required by the plan. The licensee entered this issue in the corrective action program, immediately performed the required venting and incorporated the work into their daily schedule.

  This finding is greater than minor because, if left uncorrected, the issue would have become a more significant safety concern. Since this finding is not a design or qualification deficiency, does not result in loss of system or train safety function and was not safety significance 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 licensee's operation and engineering group to schedule and coordinate work activities as prescribed by the adverse condition monitoring plan to ensure the safety systems remained operable.
  (H.3 (b)) (Section 1R15.1.b)

B. Licensee-Identified Violations

None.

REPORT DETAILS

Summary of Plant Status

Unit 1 operated at or near full power throughout the inspection period with minor exceptions. On July 21, 2008, operators reduced power to 95 percent to isolate a steam leak on the secondary system. The unit returned to full power on July 23, 2008.

Unit 2 operated at or near full power throughout the inspection period with minor exceptions. On July 10, 2008, operators reduced power to 90 percent in response to the Unit 2 Train A circulating water pump trip. The unit returned to full power on July 11, 2008, after the repair to the circulating water pump was complete.

1. REACTOR SAFETY

Cornerstone: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

.1 External Flooding

a. Inspection Scope

The inspectors evaluated the design, material condition, and procedures for coping with the design basis probable maximum flood. The evaluation included a review to check for deviations from the descriptions provided in the Updated Final Safety Analysis Report (UFSAR) for features intended to mitigate the potential for flooding from external factors. As part of this evaluation, the inspectors checked for obstructions that could prevent draining, checked that the roofs did not contain obvious loose items that could clog drains in the event of heavy precipitation, and determined that barriers required to mitigate the flood were in place and operable. Additionally, the inspectors performed a walkdown of the protected area to identify any modification to the site which would inhibit site drainage during a probable maximum precipitation event or allow water ingress past a barrier.

This inspection constituted one external flooding sample as defined in Inspection Procedure (IP) 71111.01-05.

b. Findings

No findings of significance were identified.

.2 Readiness For Impending Adverse Weather Condition – Severe Thunderstorm Watch

a. Inspection Scope

Since thunderstorms with potential tornados and high winds were forecast in the vicinity of the facility for July 7, 2008, the inspectors reviewed the licensee’s overall preparations/protection for the expected weather conditions. On July 7, 2008, the inspectors walked down the Unit 1 and Unit 2 system auxiliary transformers, in addition to the licensee’s emergency alternating current power systems, because their

safety-related functions could be affected or required as a result of high winds or tornado-generated missiles or the loss of offsite power. The inspectors evaluated the licensee staff's preparations against the site's procedures and determined that the staff's actions were adequate. During the inspection, the inspectors focused on plant specific design features and the licensee's procedures used to respond to specified adverse weather conditions. The inspectors also toured the plant grounds to look for any loose debris that could become missiles during a tornado. The inspectors evaluated operator staffing and accessibility of controls and indications for those systems required to control the plant. Additionally, the inspectors reviewed the UFSAR and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. The inspectors also reviewed a sample of corrective action program (CAP) items to verify that the licensee identified adverse weather issues at an appropriate threshold and dispositioned them through the CAP in accordance with station corrective action procedures. Specific documents reviewed during this inspection are listed in the Attachment.

This inspection constituted one readiness for impending adverse weather condition 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 A Essential Service Water System (SX) while Unit 2 Train B SX was Out of Service (OOS)
- Unit 2 Train B Residual Heat Removal System Following the Identification of Gas Voids in the Discharge Piping

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. In addition, the inspectors reviewed the CAP database to ensure that system equipment alignment problems were being identified and appropriately resolved. Documents reviewed are listed in the Attachment.

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

b. Findings

No findings of significance were identified.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

On August 05, 2008, the inspectors performed a complete system alignment inspection of the Non-Essential Service Water System to verify the functional capability of the system. This system was selected because it was considered risk-significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment line ups, electrical power availability, system pressure and temperature indications, as appropriate, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. A review of a sample of past and outstanding work orders was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the CAP database to ensure that system equipment alignment problems were being identified and appropriately resolved. Documents reviewed are listed in the Attachment.

These activities constituted one complete system walkdown sample 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 which were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- Unit 2 UCSR (Zone 3.3A-2 & 3.3B-2);
- Circulating Water Pump House (Zone 18.12-0);
- Unit 2 Train B Miscellaneous Electrical Equipment Room & Battery Room (Zone 5.4-2);
- Auxiliary Building General Area Elevation 346' (Zone 11.2-0); and
- Unit 2 Turbine Building Elevation 426' (Zone 8.5-2).

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. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

Introduction: The inspectors identified a finding of very low safety significance and an associated Non-Cited Violation of Byron Unit 1 Operating License Condition 2.C(6) and Byron Unit 2 Operating License Condition 2.E for the licensee's failure to obtain NRC approval before making changes to the fire protection program. Specifically, the licensee isolated the CO_2 suppression system to the UCSR without prior NRC approval.

Description: On July 17, 2008, the inspectors identified that the CO_2 suppression system to both Unit 1 and Unit 2 UCSRs was isolated during a routine fire protection walkdown of the Unit 2 UCSR. The inspection reviewed the isolation documentation and determined that the licensee had isolated the system since April 2002. The licensee had performed a 10 CFR 50.59 (Changes, Tests and Experiments) screening to support disabling the CO_2 suppression system in the UCSRs. The 50.59 evaluation process was the process in effect at the time used to assess the change to the fire protection program. The licensee concluded in the evaluation that the removal of CO_2 suppression system in the UCSRs did not adversely affect the ability to safety shutdown the plant following a fire.

The inspectors questioned the evaluation conclusion that the removal of CO_2 suppression did not result in an adverse affect on safe shutdown. The licensee re-performed the evaluation based on the current fire protection change regulatory review (LS-AA-128, Rev. 1) process and arrived at the same conclusion.

The fire suppression systems in the Byron UCSRs were licensed under a deviation from BTP CMEB 9.5-1. BTP CMEB 9.5-1 required automatic water fire suppression in upper cable spreading rooms. The licensee proposed an automatic halon fire suppression system, a backup manual CO_2 fire suppression system and manual firefighting capability such as hose stations and fire extinguishers rather than automatic water suppression during initial licensing. Based on NRC questions about reliability, the licensee proposed modification to the halon system to improve reliability and to add electronic monitoring of interior doors in the upper cable spreading rooms. Based on these additional actions the

NRC accepted the licensee's proposed design as an acceptable deviation from BTP CMEB 9.5-1. The NRC issued a safety evaluation report that documented this deviation and the bases for meeting the fire protection regulations, 10 CFR 50.48 and Criterion 3 of Appendix A to 10 CFR 50.

Additional reviews of the issue were provided by fire protection inspectors in the Region III and Headquarters Offices to determine whether the evaluation was completed in accordance with Generic Letter 86-10, which governs changes to the fire protection program. Since disabling the CO_2 fire suppression system resulted in a compromise of the fire protection defense-in-depth element, the complete elimination of the CO_2 suppression system from an area containing safety-related systems most likely would adversely affect the ability to achieve and maintain safe shutdown. Therefore, the inspectors concluded that the LS-AA-128 evaluation did not provide adequate justification for the conclusion that there was no adverse impact on achieving and maintaining safe shutdown. Based on the lack of adequate justification for the conclusions documented in the LS-AA-128 evaluation, the inspectors concluded that prior NRC approval was required.

Analysis: The inspectors determined that the licensee's failure to obtain NRC approval before the CO_2 fire suppression system was disable was a performance deficiency. Specifically, the licensee failed to provide an adequate justification as to why isolating the CO_2 suppression system did not adversely affect the ability to achieve and maintain safe shutdown. The finding was determined to be more than minor because the inspectors could not reasonably determine that the isolation would not have ultimately required NRC prior approval. This finding is related to the cross-cutting area of Human Performance for failure to use conservative assumptions in decision making and to adopt a requirement that demonstrates the proposed action is safe in order to proceed with respect to reviewing the plant design and license basis. (H 1(b))

Since the failure to obtain prior NRC approval for changing the fire protection program has the potential for impacting the NRC's ability to perform its regulatory function, this finding is being dispositioned under the traditional enforcement process. However, if possible, the underlying technical issue is evaluated under the SDP to determine the severity of the violation. In this case, the underlying technical issue affected the Initiating Events Cornerstone.

The finding was evaluated using IMC 0609 Appendix F, "Fire Protection SDP." The finding category assigned was Fixed Fire Protection Systems because the Upper Cable Spreading Room (UCSR) CO_2 fire suppression system was impacted. The degradation rating was determined to be "High" since the suppression system was isolated and would not have functioned to suppress a fire in the room. The duration of the degraded condition was greater than 30 days. The finding did not screen as very low safety significance (Green) in the phase 1 analysis and a phase 2 SDP analysis was required.

The inspectors and the Region III senior reactor analyst (SRA) performed an SDP Phase 2 evaluation. The UCSR contained no fixed ignition sources other than a control room ventilation subsystem. The likelihood ratings for transient combustible and hot work fires was assumed to be low because it is not a normally occupied area, plant personnel do not generally pass through the area, and the frequency of maintenance in the room was considered to be low. The UCSR also has an automatic halon

suppression system that was unaffected by the finding. The safe shutdown path for a fire in the UCSR involves manual operator actions that was also unaffected by the fire.

The SRA determined that the fire scenario of interest for this finding was fire damage state (FDS) 2, which is widespread fire damage in the fire area. The fire suppression system would not normally prevent fire damage to cables or components near the ignition source (FDS 1) but would be expected to limit the fire damage in the room and protect against widespread fire damage (FDS 2). Since none of the fire area barriers were impacted by the finding, fire damage across barriers (FDS 3 scenarios) was not evaluated.

The fire ignition frequency was estimated to be 1.4E-4/yr, assuming the ignition sources included a ventilation subsystem, transient combustibles, and hot work. The unavailability of the automatic halon suppression system was estimated to be 2.0E-2 and the CO_2 suppression system was assumed to be failed because of the finding. A screening value of 0.1 was used for the failure of the operators to safely shutdown the plant given widespread fire damage in the room. The result was an estimated change in core damage frequency (CDF) of 2.8E-7/yr, which is a finding of very low safety significance (Green).

Enforcement: License Condition 2.(6), for Byron Unit 1 and License Condition 2.E for Byron Unit 2 states, in part, that the licensee may make changes to the approved fire protection program without prior approval of the Commission, only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire. Contrary to the above, the licensee did not request NRC approval prior to isolating the CO_2 suppression system in the upper cable spreading rooms, which adversely affected the ability to achieve and maintain safe shutdown. Specifically, the licensee's evaluation did not provide an adequate justification for the conclusion that there was no adverse impact on achieving and maintaining safe shutdown.

In accordance with the Enforcement Policy, this violation of the requirements of the fire protection licensee condition was classified as a Severity Level IV violation because the underlying technical issue was of very low safety significance. Because this non-willful violation was non-repetitive, and was captured in the licensee's corrective action program, it is considered a NCV consistent with VI.A.1 of the NRC Enforcement Policy. The licensee entered this issue into their CAP as issue reports (IRs) 813664 and 819587 and implemented compensatory action to verify detection system operability. In addition the licensee plans to submit a license change request associated with the removal of CO_2 suppression from the UCSR. (NCV 05000454/2008004-01, 05000455/2008004-01)

1R11 Licensed Operator Requalification Program (71111.11)

.1 Resident Inspector Quarterly Review (71111.11Q)

a. Inspection Scope

On July 29, 2008 and September 2, 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 Facility Operating History (71111.11B)

Completion of Sections .2 through .8 does not constituted one biennial licensed operator requalification inspection sample as defined in IP 71111.11B, because the inspection of the examination results is still to be completed.

a. Inspection Scope

The inspectors reviewed the plant's operating history from January 2007 through September 2008 to identify operating experience that was expected to be addressed by the Licensed Operator Requalification Training (LORT) program. The inspector verified that the identified operating experience had been addressed by the facility licensee in accordance with the station's approved Systems Approach to Training (SAT) program to satisfy the requirements of 10 CFR 55.59(c). The documents reviewed during this inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

.3 Licensee Administration of Requalification Examinations

a. Inspection Scope

The inspectors observed the administration of a requalification operating test to assess the licensee's effectiveness in conducting the test to ensure compliance with 10 CFR 55.59(c)(4). The inspectors evaluated the performance of one crew in parallel with the facility evaluators during four dynamic simulator scenarios and evaluated various licensed crew members concurrently with facility evaluators during the administration of several job performance measures. The inspectors assessed the

facility evaluators' ability to determine adequate crew and individual performance using objective, measurable standards. The inspectors observed the training staff personnel administer the operating test, including conducting pre-examination briefings, evaluations of operator performance, and individual and crew evaluations upon completion of the operating test. The inspectors evaluated the ability of the simulator to support the examinations. A specific evaluation of simulator performance was conducted and documented in the section below titled, "Conformance with Simulator Requirements Specified in 10 CFR 55.46." The documents reviewed during this inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

.4 Examination Security

a. Inspection Scope

The inspectors observed and reviewed the licensee's overall licensed operator requalification examination security program related to examination physical security (e.g., access restrictions and simulator considerations) and integrity (e.g., predictability and bias) to verify compliance with 10 CFR 55.49, "Integrity of Examinations and Tests." The inspectors also reviewed the facility licensee's examination security procedure, any corrective actions related to past or present examination security problems at the facility, and the implementation of security and integrity measures (e.g., security agreements, sampling criteria, bank use, and test item repetition) throughout the examination process. The documents reviewed during this inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

.5 Licensee Training Feedback System

a. Inspection Scope

The inspectors assessed the methods and effectiveness of the licensee's processes for revising and maintaining its LORT Program up to date, including the use of feedback from plant events and industry experience information. The inspectors reviewed the licensee's quality assurance oversight activities, including licensee training department self-assessment reports. The inspectors evaluated the licensee's ability to assess the effectiveness of its LORT program and their ability to implement appropriate corrective actions. This evaluation was performed to verify compliance with 10 CFR 55.59(c) and the licensee's SAT program. The documents reviewed during this inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

.6 Licensee Remedial Training Program

a. Inspection Scope

The inspectors assessed the adequacy and effectiveness of the remedial training conducted since the previous biennial requalification examination and the training from the current examination cycle to ensure that they addressed weaknesses in licensed operator or crew performance identified during training and plant operations. The inspectors reviewed remedial training procedures and individual remedial training plans. This evaluation was performed in accordance with 10 CFR 55.59(c) and with respect to the licensee's SAT program. The documents reviewed during this inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

.7 Conformance With Operator License Conditions

a. Inspection Scope

The inspectors reviewed the facility and individual operator licensees' conformance with the requirements of 10 CFR Part 55. The inspectors reviewed the facility licensee's program for maintaining active operator licenses and to assess compliance with 10 CFR 55.53(e) and (f). The inspectors reviewed the procedural guidance and the process for tracking on-shift hours for licensed operators and which control room positions were granted watch-standing credit for maintaining active operator licenses. The inspectors reviewed the facility licensee's LORT program to assess compliance with the requalification program requirements as described by 10 CFR 55.59(c). Additionally, medical records for twelve licensed operators were reviewed for compliance with 10 CFR 55.53(I). The documents reviewed during this inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

.8 Conformance With Simulator Requirements Specified in 10 CFR 55.46

a. Inspection Scope

The inspectors assessed the adequacy of the licensee's simulation facility (simulator) for use in operator licensing examinations and for satisfying experience requirements as prescribed in 10 CFR 55.46, "Simulation Facilities." The inspectors also reviewed a sample of simulator performance test records (i.e., transient tests, malfunction tests, steady state tests, and core performance tests), simulator discrepancies, and the process for ensuring continued assurance of simulator fidelity in accordance with 10 CFR 55.46. The inspectors reviewed and evaluated the discrepancy process to ensure that simulator fidelity was maintained. Open simulator discrepancies were reviewed for importance relative to the impact on 10 CFR 55.45 and 55.59 operator actions as well as on nuclear and thermal hydraulic operating characteristics. The

inspectors conducted interviews with members of the licensee's simulator staff about the configuration control process and completed the IP 71111.11, Appendix C, checklist to evaluate whether or not the licensee's plant-referenced simulator was operating adequately as required by 10 CFR 55.46(c) and (d). 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:

- Unit 2 Train B SAC; and
- Non-Essential Service Water System.

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 (SSC)/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 two quarterly maintenance effectiveness samples as defined in IP 71111.12-05.

b. Findings

Introduction: A finding of very low safety significance was self-revealed when the Unit 2 Train B (2B) SAC tripped on two separate occasions due to inadequate PM. This finding

was of very low safety significance (Green) and determined not to be a violation of NRC requirements.

Descriptions: In 2005, the licensee replaced the three SACs with a new design and added redundancy by installing two compressors for each unit. Normal alignment is to run one compressor as the lead unit and one opposite unit compressor as the lag unit. The remaining two compressors normally would be in standby.

On August 31, 2008, the 2B SAC was aligned for lag. During a run, the compressor tripped and caused the service air header pressure to drop. Subsequently, one of the standby compressors started to stabilize header pressure. The cause of the compressor tripping was due to a failed discharge check valve, which allowed service air to flow backward to the compressor and actuated one of the compressor protection trip circuits. The check valve was disassembled and found to have broken closure springs and a travel stop bar. The licensee determined that the 2B SAC discharge check valve runtime had exceeded the vendor recommendation of 16,000 hours for replacement. The licensee replaced the check valve and returned the 2B SAC to service.

While the licensee was evaluating the root cause and long term corrective actions of the issue, the 2B SAC tripped again on September 9, 2008. At that time, the 2B SAC was running as lead unit and the 1A SAC was running as lag. The 2B SAC tripped on high intercooler pressure and shortly after that, the 1A SAC tripped for the same reason. The 2A and 1B SAC restarted and restored station air header pressure. The licensee determined that, for both the 2B and 1A SAC, the hydraulic cylinder, which controlled the unloader valve and compressor suction valve, was stuck during the unload sequence and failed to fully retract and close the suction valve fully. This resulted in high intercooler pressure in an unloaded SAC and caused it to trip.

The licensee performed an apparent cause evaluation and determined that PM, for the SACs had exceeded the vendor recommended maintenance frequency. The discharge check valve should have been replaced or rebuilt every 8,000 hours and the hydraulic cylinder should have been replaced every 16,000 hours. At the time of the second trip, the 2B SAC had a runtime of over 17,000 hours and the two components had never been replaced before these failures. Other components, such as the load solenoid, should have been replaced every two years per the licensee's PM template, but were not. The load solenoid, if sticks open, could also cause a high intercooler pressure trip.

When the system was installed, the PM tasks were broken into a two-year minor and four-year major overhaul. The two-year minor overhaul was later changed to a four-year frequency in fall 2007 without any bases. Therefore, the 2B SAC was overdue for its PM. The 1A, 1B and 2A SACs were also overdue for their PM; however these three SACs had much less runtime than the 2B SAC and have not experienced the repeated failures like the 2B SAC.

Analysis: The inspectors determined that the failure to perform PM on the 2B SAC 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 is greater than minor because, if left uncorrected, the issue would have become a more significant safety concern. The inspectors evaluated the finding using IMC 0609, "SDP," Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Finding," dated January 10, 2008, for the

Initiating Events Cornerstone since the significance of this issue was best reflected by the risk for loss of instrument/service air initiating event. Because the finding contributes to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions will not be available, the inspectors completed a Phase 2 SDP evaluation using the Byron risk-informed inspection notebook.

Since this finding affected both the unavailability of a component in a support system that increases the likelihood of an initiating event, the Initiating Event Likelihood was increased by one order of magnitude for the associated initiator. Specifically, the service air system is a support system to the instrument air system; and a loss of instrument air would result in a reactor scram. Based on the Phase 2 analysis, the inspectors determined that this issue is of very low safety significance (Green).

The inspectors determined that this finding was related to the cross-cutting component of Human Performance for Resources (H.2.(a)) as the licensee did not minimize PM deferrals to ensure that equipment were available and adequate to assure nuclear safety.

Enforcement: Because the SACs are not safety-related components, no violation of regulatory requirements occurred. The licensee had entered this issue into their corrective action program as IR 815475, replaced the failed components, and returned the SAC to service. The licensee is currently reassessing the SAC PM program. (FIN 05000455/2008004-02)

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

.1 Maintenance Risk Assessments and Emergent Work Control

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 1 Train A Auxiliary Feedwater Pump Work Window while Unit 2 Train B SAC was OOS;
- Unit 2 Train B SX OOS during Thunderstorm Activity;
- Unit 1 Train B Steam Generator Relief Valve Work Window while both SX Make-up Pumps were inoperable;
- Emergent Failure of Unit 2 Train A Circulating Water Pump;
- Emergent Failure of Unit 1 Train A and Unit 2 Train B SACs while Unit 2 Containment Spray System is OOS; and
- Unit 1 Train A Diesel Generator While Unit 0 Train B SX Make-up Pump was OOS.

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.

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

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- Unit 2 Train B Residual Heat Removal Following the Identification of Gas Voids in the Discharge Piping;
- Control Room Pressure Envelope Operability Following Instrument Maintenance Shop Pressure Failure;
- Auxiliary Feedwater System Rocker cover Gasket Material;
- Unit 1 Train A Containment Spray Following the Identification of Gas Void in Suction Piping;
- Unit 2 Train A Containment Spray Following the Identification of Gas Void in Suction Piping;
- Unit 1 Train A Containment Spray Eductor Line Void Identified; and
- Unit 2 Train B Containment Spray Eductor Line Void Identified.

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 seven samples as defined in IP 71111.15-05.

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 the Adverse Condition Monitoring Plan for safety injection system check valve leakage. The licensee failed to vent the safety injection line every three days as required by the plan.

Description: In November 2007, the licensee identified that the Unit 2 "C" (2C) Safety Injection Accumulator level dropped during testing of the Unit 2 Train B residual removal pump. The licensee performed an evaluation and determined that the accumulator injection check valve, 2SI8818C, was leaking-by but the accumulator was operable since the TS required level was maintained.

On January 25, 2008, the 2C accumulator level dropped 5.5% following Unit 2 Train A safety injection pump testing. The licensee entered the TS Limiting Condition of Operation (LCO) for Reactor Coolant System (RCS) Pressure Isolation Valve Leakage and performed actions to reseat the check valve. The licensee was successful in reseating the check valve and exited the LCO. As part of the corrective actions for this event, the licensee performed ultrasonic testing in containment and identified that small gas voids existed on portion of the safety injection system piping. The total volume of gas was estimated at 0.29 cubic feet. The inspectors reviewed and documented this issue in Byron Inspection Report 2008-003.

As part of an ongoing effort to address NRC Generic Letter 08-01, Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," the licensee reevaluated the issue and performed additional ultrasonic testing of the safety injection system piping inside containment in July 2008. The licensee identified that approximately 36 cubic feet of gas had accumulated in safety injection line 2SI05CB-8 at that time. This line was verified to be water solid in January 2008 and this line provides the injection flow path for the residual heat removal pumps.

The licensee performed an operability evaluation and determined that the line and the residual removal system were operable provided that the gas void did not exceed 42 cubic feet. The licensee estimated that the gas void was growing at 0.2 cubic feet per day and when the void reached 41 cubic feet, it would reach vent valve 2SI058B outside containment. In order to ensure that the gas void was below 42 cubic feet, the licensee developed an adverse condition monitoring plan to monitor the accumulator level drop and directed operation to vent the safety injection line at 2SI058B every three days. The adverse condition monitoring plan was approved on August 29, 2008. The plan directed the vent to start on September 5, 2008 and continuing until October 6, 2008. On October 6, 2008, Byron Unit 2 would start a refueling outage and this leaking check valve would be replaced during the outage.

On September 5, 2008, venting at 2SI058B started as described by the plan. The licensee continued the venting every three days until September 14, 2008. No gas was observed during the vents at this point. On September 19, 2008, the inspectors inquired about the result related to the venting on September 17, 2008. The licensee determined that no venting was performed on September 17, 2008, as directed by the adverse

condition monitoring plan. The licensee immediately performed the venting and did not observe any gas during the venting.

Analysis: The inspectors determined that the failure to perform venting of the safety injection line 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 is greater than minor because, if left uncorrected, the issue would have become a more significant safety concern. The inspectors evaluated the finding using IMC 0609, "SDP," Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Finding," dated January 10, 2008, for the Mitigating Systems Cornerstone. Since this finding is not a design or qualification deficiency, does 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 licensee's operation and engineering group to schedule and coordinate work activities as prescribed by the adverse condition monitoring plan to ensure the safety systems remained operable. (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. Contrary to this, licensee personnel failed to perform venting in accordance with the Adverse Condition Monitoring Plan for the accumulator check valve leakage to ensure operability of the residual heat removal system. Because this violation was of very low safety significance and was captured in the licensee's corrective action program (IR 819928), it is being treated as an NCV consistent with Section VI.A.1 of the NRC Enforcement Policy. (NCV 05000455/2008004-03)

1R18 Plant Modifications (71111.18)

.1 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the following temporary modifications:

- Temporary Power to Unit 2 Radiation Monitor Operator Alarm; and
- Auxiliary Feedwater System Tunnel Seal Cover Bracing.

The inspectors compared the temporary configuration changes 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(s).

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, as applicable, performed field verifications to ensure that the modifications were installed as directed; 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, engineering, and training personnel to ensure that the individuals were aware of how extended operation with the temporary modification in place could impact overall plant performance.

This inspection constituted two temporary modification samples as defined in IP 71111.18-05.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19)

.1 Post-Maintenance Testing

a. Inspection Scope

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

- Upper Cable Spreading Room Halon System Solenoid Valve Replacement;
- Unit 0 Train A Well Water Pump Head Leak Repair;
- Instrument Inverter 214 Capacity Replacement;
- Unit 2 Train B Containment Spray System Work Window; and
- Unit 0 Train B Essential Service Water Make-up Pump Governor Replacement.

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 corrective action program 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 five post-maintenance testing samples as defined in IP 71111.19-05.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

.1 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:

- Diver Inspection SX Cooling Tower Basins;
- Unit 2 Emergency Core Cooling System Venting and Valve Alignment; and
- Fire Protection Pump Flow and Pressure Test.

The inspectors observed in plant activities and reviewed procedures and associated records to selectively 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 to this report.

This inspection constituted three routine surveillance testing samples as defined in IP 71111.22, sections -02 and -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 routine licensee emergency drill on July 23, 2008, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations during the Annual Medical/Health Physics Drill to determine whether the event classification, notifications, and protective action recommendations 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.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Safety System Functional Failures

a. Inspection Scope

The inspectors sampled licensee submittals for the Safety System Functional Failures performance indicators for Unit 1 from March 2007 to April 2008, and for Unit 2 from March 2007 to March 2008. To determine the accuracy of the 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, and NUREG-1022, “Event Reporting Guidelines 10 CFR 50.72 and 50.73" definitions and guidance, were used. The inspectors reviewed the licensee’s operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, IRs, event reports and NRC Integrated Inspection reports for the period of March 2007 through June 2008, to validate the accuracy of the submittals. The inspectors also reviewed the licensee’s IR 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 safety system functional failures samples as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

.2 Reactor Coolant System (RCS) Specific Activity

a. Inspection Scope

The inspectors sampled licensee submittals for the RCS Specific Activity performance indicators for the Unit 1 RCS Specific Activity and Unit 2 RCS Specific Activity from January 2005 to March 2007. 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, IRs, event reports and NRC Integrated Inspection reports for the period of January 2005 to March 2007 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's IR 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 RCS sample. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two RCS specific activity samples as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

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

a. 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. 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 Annual Sample: Review of Operator Workarounds (OWAs)

a. Scope

The inspectors evaluated the licensee's implementation of their process used to identify, document, track, and resolve operational challenges. Inspection activities included, but were not limited to, a review of the cumulative effects of the OWAs on system availability and the potential for improper operation of the system, for potential impacts on multiple systems, and on the ability of operators to respond to plant transients or accidents.

The inspectors performed a review of the cumulative effects of OWAs. The documents listed in the Attachment were reviewed to accomplish the objectives of the inspection procedure. The inspectors reviewed both current and historical operational challenge records to determine whether the licensee was identifying operator challenges at an appropriate threshold, had entered them into its corrective action program, and proposed or implemented appropriate and timely corrective actions which addressed each issue. Reviews were conducted to determine if any operator challenge could increase the possibility of an initiating event, and if the challenge was contrary to training, required a change from long-standing operational practices, or created the potential for inappropriate compensatory actions. Additionally, temporary modifications were reviewed to identify any potential effect on the functionality of Mitigating Systems, impaired access to equipment, or required equipment uses for which the equipment was not designed. Daily plant and equipment status logs, degraded instrument logs, and operator aids or tools being used to compensate for material deficiencies were also assessed to identify any potential sources of unidentified OWAs.

The above constituted completion of one OWAs annual inspection sample as defined in IP 71152-05.

b. Findings and Observations

No findings of significance were identified.

The inspectors' review determined that few items were being assessed by the Operator Workaround Board (WAB) as OWAs. Most items reviewed by the WAB were determined to be Operator Workaround Challenges (OWC). Items determined to be an OWC receive a lower priority for correction. The inspectors performed additional follow-up in the apparent discrepancy in the low number of OWAs. In interviews with licensee personnel the inspectors determined that most items that are OWAs are identified as such by the Shift Managers, placed on the Plan of the Day (POD) as a high priority item and corrected in a timely manner. As the WAB meets at the procedurally required minimum of once per quarter, this has the result that few OWAs are actually identified as such in accordance with the licensee's procedure. In addition, the WAB does not document OWAs that had been identified as such since their last meeting but had already been corrected.

Licensee personnel stated they would re-assess the current usage of the OWA program to see if enhancements needed to be made that could better document, track, and trend all OWAs, not just those that happened to be open during their quarterly meetings.

.4 Selected Issue Follow-Up Inspection: Low Cooling Flow on the Non-Essential Service Water Pumps

a. Inspection Scope

During a review of items entered in the licensee's CAP, the inspectors recognized a number of corrective action items documenting low cooling flow to the non-essential service water pumps. Since the non-essential service water system contributes about 12% to the core damage frequency per the latest Byron Probabilistic Risk Assessment model, the inspectors selected this issue for a follow-up inspection on problem identification and resolution.

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

b. Findings and Observations

No findings of significance were identified.

The non-essential service water system is a raw water system that consists of three vertical wet pit pumps that are common to the two Byron units. The purpose of the system is to provide cooling water to loads that are not safety-related and not essential to the safe shutdown of the plant. Each pump discharges water into a common header and then the water flows through three parallel system strainers before it reaches the system loads.

Normally, two pumps are running with one pump in standby or in maintenance outage. The pumps are cooled by their own discharge flow where a small cooling line branches off downstream of the pump discharge check valve. The cooling line has a small strainer to prevent foreign material getting into the pump.

From October 2006 to April 2008, all three non-essential service water pumps were operating reliably. However, from April 2008 to the end of this reporting period, the licensee has experienced eight failures when cooling water flow to the non-essential service water pumps was lost. The failures were limited to the "B" and "C" pumps while they were in standby. Initially, the licensee flushed the cooling line to clear the obstruction and revised the operator round to cycle the strainer and blowdown valves to remove any blockage periodically. The licensee also started to evaluate a modification to the cooling line from a cleaner source downstream of the system strainers.

When one of the pumps failed again in August, the licensee implemented a periodic pump swap to minimize any debris collected in the stagnant pump discharge line. The licensee also identified that an unusual amount of the debris came from the natural draft cooling tower fill, which suffered some structural damage this past winter. The licensee suspected that the abnormal high Rock River level this spring had resulted in an increase in the amount of silt and debris migrated into the circulating water flume, which was where the non-essential water pumps take suction. Therefore, the licensee approved the modification to reconfigure the pump cooling water lines such that they would tap off from the discharge of the non-essential water system strainers where debris would be removed. Other actions included suction strainer inspection and circulating water intake screen. Due to long lead time for a modification, the licensee installed a temporary cooling line for each pump. This temporary modification mimicked the proposed permanent configuration change and the pumps have not had any failure since the new cooling lines were implemented.

At the end of this reporting period, the number of non-essential service water pump failures had exceeded the maintenance rule reliability performance criterion. The inspectors reviewed the maintenance effectiveness of this issue and documented in Section 1R12 of this report.

In summary, the inspectors determined that the licensee has identified and evaluated the issue appropriately. Due to the long lead time for the modification and the nature of the debris collection, the corrective actions were considered timely. Therefore, no finding of significance was identified.

.5 Selected Issue Follow-Up Inspection: Unit 2 Train B Residual Heat Removal Following the Identification of Gas Voids in the Discharge Piping

a. Inspection Scope

During a review of items entered in the licensee's CAP, the inspectors observed that the licensee had identified a gas void in the discharge piping to the Unit 2 Train B RHR piping. The inspectors selected this issue for a follow-up inspection on problem identification and resolution.

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

b. Findings and Observations

No findings of significance were identified.

In November 2007, the licensee identified that the Unit 2 “C” (2C) Safety Injection Accumulator level dropped during testing of the Unit 2 Train B residual removal pump. The licensee performed an evaluation and determined that the accumulator injection check valve, 2SI8818C, was leaking-by but the accumulator was operable since the TS required level was maintained.

On January 25, 2008, the 2C accumulator level dropped 5.5% following Unit 2 Train A safety injection pump testing. The licensee entered the TS LCO for RCS Pressure Isolation Valve Leakage and performed actions to reseat the check valve. The licensee was successful in reseating the check valve and exited the LCO. As part of the corrective actions for this event, the licensee performed ultrasonic testing in containment and identified that small gas voids existed on portion of the safety injection system piping. The total volume of gas was estimated at 0.29 cubic feet. The inspectors reviewed and documented this issue in Byron Inspection Report 2008-003.

As part of an ongoing effort to address NRC Generic Letter 08-01, Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems,” the licensee reevaluated the issue and performed additional ultrasonic testing of the safety injection system piping inside containment in July 2008. The licensee identified that approximately 36 cubic feet of gas had accumulated in safety injection line 2SI05CB-8 at that time. This line was verified to be water solid in January 2008 and this line provides the injection flow path for the residual heat removal pumps.

The licensee performed an operability evaluation and determined that the line and the residual removal system were operable provided that the gas void did not exceed 42 cubic feet. The licensee estimated that the gas void was growing at 0.2 cubic feet per day and when the void reached 41 cubic feet, it would reach vent valve 2SI058B outside containment. In order to ensure that the gas void was below 42 cubic feet, the licensee developed an adverse condition monitoring plan to monitor the accumulator level drop and directed operation to vent the safety injection line at 2SI058B every 3 days. The adverse condition monitoring plan was approved on August 29, 2008. The plan directed the vent to start on September 5, 2008 and continuing until October 6, 2008. On October 6, 2008, Byron Unit 2 would start a refueling outage and this leaking check valve would be replaced during the outage.

A brief description of this event was documented in Section 1R15 of this report. With regards to problem identification and resolution, the inspectors determined that the licensee had appropriately identified and evaluated the issue when it was discovered. The inspectors also determined the licensee had reassessed the issue and extent of conditions when new information was discovered in response to generic Letter 2008-01. The inspectors determined that the licensee had initiated appropriate corrective actions. However, the licensee’s failure to carry out one of the actions was documented in Section 1R15 of this report.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153)

.1 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.

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.

4OA6 Management Meetings

.1 Exit Meeting Summary

On October 10, 2008, 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 potential report input discussed was considered proprietary.

.2 Interim Exit Meetings

On September 26, 2008, an interim exit was conducted for licensed operator requalification training program inspection with the plant manager, Mr. B. Adams.

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

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

D. Hoots, Site Vice President
B. Adams, Plant Manager
A. Daniels, Nuclear Oversight Manager
C. Gayheart, Operations Manager
S. Greenlee, Engineering Director
B. Grundmann, Regulatory Assurance Manager
D. Thompson, RP Manager

Nuclear Regulatory Commission

R. Skokowski, Chief, Branch 3, Division of Reactor Projects

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000454/2008004-01 05000455/2008004-01	NCV	Isolating Carbon Dioxide Fire Suppression System in Upper Cable Spreading Rooms Without Prior NRC Approval
05000455/2008004-02	FIN	Inadequate Preventive Maintenance for the Unit 2 Train B Station Air Compressor
05000455/2008004-03	NCV	Missed Venting of the Safety Injection System Piping

Closed

05000454/2008004-01 05000455/2008004-01	NCV	Isolating Carbon Dioxide Fire Suppression System in Upper Cable Spreading Rooms Without Prior NRC Approval
05000455/2008004-02	FIN	Inadequate Preventive Maintenance for the Unit 2 Train B Station Air Compressor
05000455/2008004-03	NCV	Missed Venting of the Safety Injection System Piping

LIST OF DOCUMENTS REVIEWED

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

Section 1R01: Adverse Weather Protection

0BOA ENV-2; Rock River Abnormal Water Level Unit 0, Revision 100
0BOA ENV-1; Adverse Weather Conditions Unit 0, Revision 103
Byron UFSAR 2.4.2.3; Effects of Local Intense Precipitation
B/B UFSAR 3.4.1; Flood Protection
OP-AA-108-111-1001; Severe Weather and Natural Disaster Guidelines, Revision 2

Corrective Action Documents as a Result of NRC Inspection

IR 802410; Non-Functional Drainage Ditches by CW Towers, July 31, 2008
IR 816089; Material Condition Issues by ISFSI Area, September 10, 2008

Section 1R04S: Equipment Alignment

Diagram of Non-Essential Service Water M-43; Sheet Number 1, Revision BC
Diagram of Non-Essential Service Water M-43; Sheet Number 2A, Revision AF
Diagram of Non-Essential Service Water M-43; Sheet Number 2B, Revision W
Diagram of Non-Essential Service Water M-43; Sheet Number 3, Revision AY
Diagram of Non-Essential Service Water M-43; Sheet Number 3A, Revision C
Diagram of Non-Essential Service Water M-43; Sheet Number 4, Revision AW
Diagram of Non-Essential Service Water M-43; Sheet Number 5, Revision C
Diagram of Non-Essential Service Water M-43; Sheet Number 6, Revision H
Diagram of Non-Essential Service Water M-43; Sheet Number 7, Revision 6
Diagram of Non-Essential Service Water M-127; Sheet Number 1A, Revision AH
Diagram of Non-Essential Service Water M-127; Sheet Number 1B, Revision AD
Diagram of Non-Essential Service Water M-127; Sheet Number 2, Revision AL
BOP WS-E1; Non-Essential Service Water Electrical Lineup, Revision 4
BOP WS-M1; Non-Essential Service Water System Valve Lineup, Revision 52
BOP RH-M2B; Train B Residual Heat Removal System Valve Lineup, Revision 7
BOP RH-E2B; Unit 2 Residual Heat Removal System, Train B Electrical Lineup, Revision 2
BOP SI-E1B; Unit 1 Safety Injection System Train B Electrical Lineup, Revision 3
BOP SI-E1; Unit 1 Safety Injection System Electrical Lineup, Revision 7
BOP SI-M1B; Train B Safety Injection System Valve Lineup, Revision 7
BOP SI-E1C; Unit 1 Safety Injection System Electrical Lineup, Revision 4
BOP RH-E2A; Unit 2 Residual Heat Removal System Electrical Lineup, Revision 3
BOP RH-M2A; Train A Residual Heat Removal System Valve Lineup, Revision 7
BOP RH-E2; Unit 2 Residual Heat Removal System Electrical Lineup, Revision 0
BOP SX-E2; Essential Service Water Electrical Lineup, Revision 7
BOP SX-E2A; Essential Service Water Train “A” Electrical Lineup, Revision 1
BOP SX-M2A; Unit 2 – Train “A” Essential Service Water System Valve Lineup, Revision 7
M-126, Sheet 1; Diagram of Essential Service Water, Revision AZ

M-126, Sheet 2; Diagram of Essential Service Water, Revision AD
M-126, Sheet 3; Diagram of Essential Service Water, Revision AE

Corrective Action Documents as a Result of NRC Inspection

IR 802867; Minor Corrosion on 0B FP Battery Terminals, August 01, 2008
IR 809678; Dry Boric Acid Downstream of Valve 2RH003B, August 21, 2008
IR 809680; Corrosion on RH HX Piping on 2A, August 21, 2008
IR 809681; Corrosion on RH HX Piping on 2B, August 21, 2008
IR 809980; 2SI811A Identified by NRC to Have Boric Acid Deposits on it, August 22, 2008
IR 809982; Boric Acid Deposits on 2SI046, August 22, 2008
IR 809222; Valve Linkage Support Missing One Anchor Bolt of 4, August 20, 2008
IR 810052; Valve 2SI8811A Has Boric Acid Residue on MOV/CAN/Handwheel, August 22, 2008
IR 810063; Valve 2SI046 Has Dried Boron Accumulation, August 22, 2008

Section 1R05: Fire Protection

Miscellaneous Mechanical Carbon Dioxide System; Unit 1 UCSR Admin to Remove From Service Pending Abandonment, April 5, 2002
IR 684750; Abandonment of Both UCSR Unit 1 and Unit 2 CO2 Manual Back-Up, October 15, 2007
IR 805513; EOC to Byron from Braidwood IR 805480, August 09, 2008
IR 823253; Safeguards Information Slows Fire Response, September 27, 2008
Pre Fire Plan; Upper Cable Spreading Room 2EE-2; Zone 3.3B-2
Pre Fire Plan; Upper Cable Spreading Room 2EE-1; Zone 3.3A-2
Clearance Order 6811; Miscellaneous Mechanical Carbon Dioxide System, Isolate CO2 to UCSR, April 05, 2002
Pre Fire Plan; Circulating Water Pump House Zone 18.12-0, January 31, 2007
Pre Fire Plan; Division 22 Miscellaneous Electrical Equipment and Battery Room, Zone 5.4-2, Revision 5
Pre Fire Plan; Auxiliary Building Elevation 346’-0”, Zone 11.2-0 West, January 31, 2007
Pre Fire Plan; Auxiliary Building Elevation 346’-0”, Zone 11.2-0 North, January 31, 2007
Pre Fire Plan; Auxiliary Building Elevation 346’-0”, Zone 11.2-0 Northwest, January 31, 2007
Pre Fire Plan; Auxiliary Building Elevation 346’-0”, Zone 11.2-0 South, January 31, 2007
Pre Fire Plan; Auxiliary Building Elevation 346’-0”, Zone 11.2-0 Southwest, January 31, 2007
Pre Fire Plan; Unit 2 Turbine Building Elevation 426’-0”, Zone 8.5-2 Northwest, January 31, 2007
Pre Fire Plan; Unit 2 Turbine Building Elevation 426’-0”, Zone 8.5-2 Southwest, January 31, 2007
Pre Fire Plan; Unit 2 Turbine Building Elevation 426’-0”, Zone 8.5-2 Southeast, January 31, 2007
Pre Fire Plan; Unit 2 Turbine Building Elevation 426’-0”, Zone 8.5-2 Northeast, January 31, 2007
Drawing A-319; Auxiliary Building Floor Plan Elevation 463’5”- Area 3, Revision AR
Fire Protection Impairment Permit 08-16; Scaffold Building Will Impact the Design Spray Pattern of the Installed Sprinkler System, Elevation 426’, August 15, 2008
Fire Protection Impairment Permit 08-17; Scaffold Building Will Impact the Design Spray Pattern of the Installed Sprinkler System, Elevation 418’, August 15, 2008
Unit 0/1/2 Standing Order; Log Number 08-045, Actions Due to CO2 Isolated to UCSR, September 18, 2008

50.59 Screening GE-02-0120; Disable CO2 Suppression System in the Upper Cable Spreading Rooms, Revision 0
LS-AA-128; Fire Protection Change Regulatory review (FPCRR), August 29, 2008
PMID# 141317-02; Five Year Hose Replacement UCSR hard Hose

Corrective Action Documents as a Result of NRC Inspection

IR 798763; Issue with the UCSR Backup CO2 Fire Suppression, July 21, 2008
IR 809979; Possible Non-Compliance with Fire Protection License Condition, August 22, 2008
IR 813664; Inappropriate Long-Term Clearance Orders For UCSR C02 System, September 03, 2008
IR 819587; NRC Conclusion that Fire Protection Change Needed NRC Prior Approval, September 18, 2008
IR 823979; Fire Hose Station 36 Valve Isolation Possible Leak By, September 29, 2008
IR 823982; Hose Station 44 Isolation Valve Has Possible Leak By, September 29, 2008

Section 1R11: Licensed Operator Requalification Program

NOSPA-BY-07-1Q; Nuclear Oversight Quarterly Report – Byron, Jan – Mar 07, April 25, 2007
NOSPA-BY-07-2Q; Nuclear Oversight Quarterly Report – Byron, Apr – Jun 07, July 25, 2007
NOSPA-BY-07-3Q; Nuclear Oversight Quarterly Report – Byron, July – Sept 07, October 24, 2007
NOSPA-BY-07-4Q; Nuclear Oversight Quarterly Report – Byron, Oct – Dec 07, January 25, 2008
Medical Records for 12 Licensed Operators Various
NOSA-BYR-08-06; Training and Staffing Audit Byron Station (AR 707982), July 23, 2008
Byron Learning Programs Site Functional Report, August 28, 2008
Byron Operations Performance Report, July 31, 2008
Byron 1Q08 Challenge Board – Learning Programs Performance Summary
Byron 1Q08 Challenge Board Training Performance Summary
Byron 1Q08 Challenge Board Operations Performance Summary
LS-AA-126-1001; Byron Station 2008 Pre-NRC 71111.11 Inspection Licensed Operator Requalification Training Assessment, June 20, 2008
2006-2012 Byron Licensed Operator Requalification Long Range Training Plan
TQ-AA-106-0102; Exelon Nuclear Licensed Operator Requalification Training Classroom Attendance Sheets, Cycle 2007-1 through 1008-4
OP-AA-105-102; NRC Active License Maintenance, Rev 9
BAP 320-1; Shift Staffing, Rev 17
2006 Byron Station Licensed Operator Requalification Exam Report
2007 Byron Station Licensed Operator Requalification Exam Report
Nuclear Issue 00585057, TRNG – Procedure Enhancement Opportunity, January 30, 2007
Nuclear Issue 00588946, TRNG – Missed Training Due to Illness, February 08, 2007
Nuclear Issue 00596137, NRC White Finding at Nine Mile for Licensed Operator Requalification, February 26, 2007
Nuclear Issue 00598010, TRNG – LORT Reactivity Management Performance Results, March 01, 2007
TQ-AA-210-5103; Trainee Reaction – Multiple Topics, Multiple Dates Operations Sample Plan, Rev. 0
TQ-AA-210-5106; Evaluation Summary Feedback – Many pages, various dates, Rev 0
TQ-BY-302-0101; Byron Plant-Referenced Simulator Certification Plan, Rev 0
TQ-AA-301; Simulator Configuration Management, Rev 7

TQ-AA-302; Simulator Testing Document, Rev 7
TQ-AA-303; Controlling Simulator Core Updates and Thermal Hydraulic Model Updates, Revision 5
OP-AA-105-102; Actuation Certification Checklist, July 01, 2008
Completed Simulator Work Request Report, September 22, 2008
Open Simulator Work Request Report, September 22, 2008
Simulator Review Board Meeting Minutes (Various), August 17, 2007- September 8, 2008
Byron Simulator Minor Maintenance Report, May 1, 2009 - September 25, 2008
SS-1; Simulator Steady State Test, Lower Power, January 31, 2008
SS-2; Simulator Steady State Test, Mid-Range, February 01, 2008
SS-3; Simulator Steady State Test, Full Power, January 28, 2008
TR-1; Simulator Transient Test, Manual Reactor Trip, June 16, 2008
TR-5; Simulator Transient Test, Trip of Any Single RCP, June 16, 2008
CC-04; Simulator Malfunction Test, Essential CC to RH Hx Leak, October 09, 2007
CV-12; Simulator Malfunction Test, Letdown Relief Valve Fails Open, September 04, 2007
ED-07; Simulator Malfunction Test, Loss for 4160 VAC Bus, October 03, 2007
TH-21; Simulator Malfunction Test, SV Setpoint Failure, April 28, 2008
TR-2; Simulator Transient Test, Simultaneous Trip of all MFW Pumps, July 17, 2008
Braidwood LER 2007-01; Reactor Trip Following a 345 KV Transmission Line Lightning Strike, July 23, 2008
Cycle 15 Core Performance Test, July 21, 2008
Cycle 16 Core Performance Test, February 12, 2008

Section 1R12: Maintenance Effectiveness

IR 633034; 2B SAC Tripped on High I/C Temperature, May 23, 2007
IR 765455; WS PP Oil Cooler and Seal Cooler Flow Indicates Zero, April 21, 2008
IR 788943; Oil Cooler Flow Dropping Off, June 21, 2008
IR 791406; No Cooling Water Flow from Upper Motor Bearing Cooler 0B WS PP, June 28, 2008
IR 807709; No Cooling Water Flow, August 15, 2008
IR 810414; 0C WS Pump Had to be Secured when Seal Cooling Stopped, August 25, 2008
IR 812392; 0B WS Pump Has No Cooling Flow Indicated, August 29, 2008
IR 812790; 2B SAC Trip Causes Reduction in SA/IA Header Pressure, August 31, 2008
IR 813290; Diver Inspection of 0A WS Pump Suction Strainer, September 02, 2008
IR 815475; Loss of 1A & 2B SAC, September 09, 2008
IR 816333; 0A WS Pump Suction Strainer Screen Inspection, September 10, 2008
IR 824157; No Cooling Flow Indicated for 0B WS Pump, September 30, 2008
IR 825665; Perform Maintenance Rule (A)(1) Determination for WS System, October 02, 2008
IR 818174; No Cooling Flow Observed on 0B WS Pump Upper Cooling Line, September 16, 2008
Maintenance Rule Monthly Evaluation; Station Air System, August 13, 2008
Maintenance Rule Monthly Evaluation; Non-Essential Service Water System, September 17, 2008
Byron Nuclear Power Station Probabilistic Risk Assessment Revision 5B; Summary Document, December 2003
BOP SA-12; Operations of Sierra Station Air Compressor, Revision 23
Apparent Cause Report – (Equipment); Loss of 1A & 2B SAC, October 03, 2008

Corrective Action Documents as a Result of NRC Inspection

IR 825287; Maintenance Rule Differences Between Byron and Braidwood, October 01, 2008

Section 1R13: Maintenance Risk Assessment and Emergent Work Evaluation

Unit 2 Risk Configurations, Week of July 07, 2008, Revision 2
Unit 2 Risk Configurations & Protected Equipment Log, Week of September 08, 2008
Unit 2 Risk Configurations; Week of September 15, 2008
IR 795611; Single Point Vulnerability to Lose All 3 CW Pumps, July 10, 2008
Operations Log; August 25, 2008 to August 29, 2008
Unit 1 Risk Configurations, Week of August 25, 2008, Revision 3
Unit 1 Risk Configurations, Week of August 25, 2008, Revision 4
Protected Equipment Log; September 02, 2008
Protected Equipment Log; September 17, 2008
Unit 1 Risk Configurations; Week of September 01, 2008, Revision 3
Unit 1 Risk Configurations, Week of September 15, 2008, Revision 2
IR 815974; Potential Online Risk Concern for Heavy Load Lift, September 10, 2008
IR 816785; Need Specific Guidance for Heavy Load Lift Risk Evaluations, September 11, 2008
Byron Operating Department Policy Statement - Policy No: 400-47; Online Risk/Shutdown Risk/Protected Equipment, Revision 12

Section 1R15: Operability Evaluations

IR 805068; CRE Space Found To Be Negative with Respect to Adjacent Space, August 07, 2008
IR 805071; Engineering Evaluation Needed for MCR Envelope, August 07, 2008
IR 805249; Request for Operations to Re-Stroke Time 1RY8028 with Process Press, August 08, 2008
IR 809263; UT Shows Small Void Near 2CS009A Valve, August 20, 2008
IR 814574; 1RY8028 LCOAR Issues Related to Administrative Control of 1PW005, September 05, 2008
IR 822389; Gas Observed During Vent of 2SI58B, September 25, 2008
IR 826613; Venting From 2SI058B, October 04, 2008
IR 697387; 2C SI Accumulator level Dropped Approximately 4% in 48 Hours, November 10, 2007
IR 727020; Unexpected 2C SI Accumulator Level Drop, January 25, 2008
IR 728084; Need UT Exam of SI Piping to Determine if Gas Void Present, January 28, 2008
IR 729265; Gas Void UT Exam Results for Unit 2 SI, January 30, 2008
IR 795175; Evaluation of 2C SI Accumulator Leakage Needed, July 10, 2008
IR 801122; IR OP Challenge Board – IR 795175 Operability Questions, July 28, 2008
IR 805449; VC (Control Room) LCOAR Exit Considerations, August 08, 2008
IR 806850; Unit 2 Nitrogen Gas Accumulation in Line 2SIo5CB-8, August 13, 2008
IR 808271; Request UT Downstream 1CS009A, August 18, 2008
IR 808272; Request UT Downstream 2CS009A, August 18, 2008
IR 809185; AF Rocker Cover Gasket Change, August 20, 2008
IR 809263; UT Shows Small Void Near 2CS009A Valve, August 20, 2008
IR 815865; Gas Void Found in Line 1CS12AA, September 09, 2008
IR 815869; Gas Void Found in Line 2CS12AB, September 09, 2008
IR 823044; NOS Identified GL 2008-01 System Evaluation Issues, September 26, 2008
IR 826844; Gas in SI System, October 05, 2008
WO 01123525 01; B Train Control Room Envelope Differential Pressure Verification, August 07, 2008

LTR-LIS-08-594; LOCA Input for Byron Unit 2 Operability Assessment: Non-Condensable Gas Found in Residual Heat Removal Discharge Line, August 19, 2008
Adverse Condition Monitoring Plan 2SI8818C Check Valve Leakage, August 29, 2008
Operability Evaluation 08-006; Gas Void Upstream of Valves 2SI8818B and 2SI8818C, Revision 0
FAI/08-119; Scoping Calculations on Possible Gas Accumulation in Byron Unit 2, August 2008
Eval 08-114; Westinghouse Input for Exelon Operability Assessment of Byron Unit 2 Safety Injection System (SIS) Piping Gas Void, August 19, 2008
BYR-00858; Elevated Temperature Compression Testing of AF Diesel Rocker Cover Gaskets for Byron Station, August 19, 2008
OP-AA-108-111; Adverse Condition Monitoring and Contingency Planning, Revision 4
Engineering Change 343684 000; Evaluation of Voiding in CS Pump Eductor Lines

Corrective Action Documents as a Result of NRC Inspection

IR 810007; Question Regarding IR 809185, August 22, 2008
IR 819928; 2SI058B Was Not Vented Per ACMP, September 19, 2008

Section 1R18: Plant Modifications

Analysis No.: 5.6.3.9-BYR08-068; Evaluate the AF Tunnel Covers (modified per EC 371278 & 371279) for pressure due to High energy Line Break (HELB), Revision 1
EC 366685; Operations Evaluation 07-006, Auxiliary Feedwater Tunnel Cover Plate Evaluation, Revision 004
EC 381278; Auxiliary Feedwater Tunnel Flood seal covers Bracing (Unit 1) for High Energy Line Break (HELB) Loading (TCCP), Revision 003
WO 01147685 01; Install TCCP EC 371278, July 01, 2008

Corrective Action Documents as a Result of NRC Inspection

IR 814537; NRC Observation Regarding TCCP on 2PM10J, September 05, 2008
IR 816812; Problem with AF Tunnel Cover Loop 1C, September 11, 2008

Section 1R19: Post Maintenance Testing

WO 653713 01; Replace Solenoid for Halon 2FSV-FP273B, July 16, 2008
WO 653717 01; Replace Solenoid for Halon 2FSV-FP253, July 16, 2008
WO 854546 01; Replace Capacitors Every Other Outage, August 04, 2008
WO 854546 02; ST-EM Inspect and Stage Capacitors Prior to Installation
WO 854546 03; OPS PMT Startup Inverter, September 04, 2008
WO 915331-01; Minor Leakage from 0A WW PP Well Head, August 19, 2008
WO 891447 02; Perform Diagnostic Testing on 2CS019B, September 10, 2008
WO 891447 03; Operations PMT Perform STT/PIT for 2CS019B, September 10, 2008
WO 915331 04; OPS PMT: Perform 0BOSR Z.7.A.2-1 Check Well Head for Leaks, August 20, 2008
WO 1017759 01; Upper Cable Spreading Room Area 2EE1 Halon System Actuation 18 Month Surveillance, July 17, 2008
WO 1097661 02; Operations PMT – Eight Hour Run and Raise and Lower Speed – No Leaks, August 28, 2008
WO 1097861 01; Repair Governor Speed Adjustment Mechanism, August 26, 2008

WO 1140884 01; 2CS01PB Group B IST Requirements for Containment Spray Pump, September 10, 2008
IR 722729; 0B SX Makeup Pump Engine Speed Drifting Up While Running, January 15, 2008
IR 722780; 0B SX Makeup Pump Loss of Discharge Pressure, January 16, 2008
Apparent Cause Report; 0B SX Makeup Pump Loss of Discharge Pressure

Corrective Action Documents as a Result of NRC Inspection

IR 809222; Valve Linkage Support Missing One Anchor Bolt of 4, August 20, 2008

Section 1R22: Surveillance Testing

0BVSR SX-5; Inspection of River Screen House and Essential Service Water Cooling Tower Basins, Revision 3 and 4 performed on July 15, 2008, June 18, 2008, June 3, 2007, July 10, 2007, May 25, 2006, June 21, 2006, June 23, 2005 and June 29, 2005,
IR 665153; 2VF017 Not Draining Sightglass Properly, August 27, 2007
IR 797179; Work Management for Flow Surveillance, July 16, 2008
IR 798599; 0FP222G Valve Blockage, July 21, 2008
IR 798603; 0FP222D Leakby, July 21, 2008
IR 798609; 0FP222C Bonnet Leak, July 21, 2008
IR 798615; 0FP225 Clear Obstruction and Inspect Valve, July 21, 2008
IR 798626; 0BVSR 3.10.B.12-1 Changes Needed, July 21, 2008
IR 810680; Chugging Flow Noted During 2RH004C Venting, August 25, 2008
WO 1156011-01; ECCS Venting and Valve Alignment Monthly Surveillance, August 25, 2008
WO 986747-01; Fire Protection Pump Flow and Pressure Test, July 16, 2008

Corrective Action Documents as a Result of NRC Inspection

IR 802059; Fuel Oil Leaks on 1B DG during Monthly Run, July 30, 2008

Section 40A1: Performance Indicator Verification

IR 694871; Additional Reportability Requirements May Apply to IR 691325, November 05, 2007
Monthly Data Elements for NRC Safety System Functional Failure, March 2008
Monthly Data Elements for NRC Safety System Functional Failure, December 2007
Monthly Data Elements for NRC Safety System Functional Failure, June 2007
Monthly Data Elements for NRC Safety System Functional Failure, March 2007

Section 40A2: Identification and Resolution of Problems

OP-AA-102-103; Operator Work-Around Program, Revision 2
OWA Board Meeting Minutes; Year 2007 Quarter 4, December 20, 2007
OWA Board Meeting Minutes; Year 2008 Quarter 1, March 13, 2008
OWA Board Meeting Minutes; Year 2008 Quarter 2, June 26, 2008
OWA Board Meeting Minutes; Year 2008 Quarter 3, September 25, 2008
IR 728650; NOS Identified Potential Operator Work-Around Issues, January 29, 2008
IR 732010; NOS Identified Operator Work-Around Program Issues, February 05, 2008
IR 805880; Material Condition of Unit 1 ES/HD is Unacceptable, August 11, 2008
IR 808121; 1BOA TG-1 is an Operator Challenge, August 18, 2008
IR 814779; Potential Operator Challenges, September 06, 2008
Training Request TR 08-173; ILT, CRC to Review Covering OP-AA-102-103 in Class

Training Request TR 08-175; EO Requalification and Initial, CRCs to Review Covering OP-AA-102-103 in Class

Corrective Action Documents as a Result of NRC Inspection

IR 817071; Challenge on Operations Practice of SX Strainer Backwash, September 12, 2008
IR 802059; Fuel Oil Leaks on 1B DG during Monthly Run, July 30, 2008
IR 809456; Limitation Guidance Issues Identified in 1/2BOSR 5.2.2-1, August 20, 2008

LIST OF ACRONYMS USED

BTP	Branch Technical Position
CAP	Corrective Action Program
CDF	Core Damage Frequency
CFR	Code of Federal Regulations
CO_2	Carbon Dioxide
FDS	Fire Damage State
IEMA	Illinois Emergency Management Agency
IMC	Inspection Manual Chapter
IR	Issue Report
LCO	Limiting Condition of Operation
LORT	Licensed Operator Requalification Training
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
OOS	Out of Service
OWA	Operator Work Around
OWC	Operator Work Challenge
PARS	Publicly Available Records
PM	Preventive Maintenance
POD	Plan of the Day
RCS	Reactor Coolant System
SAC	Station Air Compressor
SAT	Systems Approach to Training
SDP	Significance Determination Process
SRA	Senior Reactor Analyst
SX	Essential Service Water System
TS	Technical Specification
UCSR	Upper Cable Spreading Room
UFSAR	Updated Final Safety Analysis Report
WAB	Work Around Board