

February 12, 2007

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

SUBJECT: BYRON STATION, UNITS 1 AND 2 NRC INTEGRATED INSPECTION  
REPORT 05000454/2006005 AND 05000455/2006005

Dear Mr. Crane:

On December 31, 2006, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Byron Station, Units 1 and 2. The enclosed report documents the inspection findings which were discussed on January 16, 2007, with Mr. Dave 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.

This report documents one NRC-identified finding of very low safety significance (Green). This finding did not involve a violation of NRC requirements.

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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 05000454/2006005 and 05000455/2006005  
w/Attachment: Supplemental Information

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

C. Crane

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Director Licensing  
Manager Licensing - Braidwood and Byron  
Senior Counsel, Nuclear  
Document Control Desk - Licensing  
Assistant Attorney General  
Illinois Emergency Management Agency  
State Liaison Officer, State of Illinois  
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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: 05000454/2006005 and 05000455/2006005

Licensee: Exelon Generation Company, LLC

Facility: Byron Station, Units 1 and 2

Location: 4450 N. German Church Road  
Byron, IL 61010

Dates: October 01, 2006, through December 31, 2006

Inspectors: D. Smith, Project Engineer  
B. Bartlett, Senior Resident Inspector  
R. Ng, Resident Inspector  
J. Cassidy, Health Physicist  
T. Go, Health Physicist  
T. Bilik, Reactor Inspector  
M. Garza, Emergency Response Specialist  
M. Bielby, Senior Operations Engineer  
N. Valos, Senior Operations Engineer  
C. Thompson, Resident Inspector, Illinois Emergency  
Management Agency

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

## SUMMARY OF FINDINGS

IR 05000454/2006005, 05000455/2006005;10/01/2006-12/31/2006; Byron Station, Units 1 and 2; Identification and Resolution of Problems.

This report covers a 3-month period of baseline resident inspection and announced baseline inspections on Emergency Preparedness, Licensed Operator Requalification Training and Temporary Instruction 2515/169, "Mitigating Systems Performance Index Verification." These inspections were conducted by regional inspectors and the resident inspectors. Two Green findings were described in this report, one of which was a non-cited violation (NCV) under the traditional enforcement process. The NCV was originally provided to the licensee in a separate letter, dated December 5, 2006. The emergency preparedness portion of this inspection is being tracked using Inspection Report 05000454/2006012, 05000455/2006012. The significance of most findings is indicated by their color (Green, White, yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be "Green" or be assigned a severity level after NRC management review. NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

### **A. Inspector-Identified and Self-Revealed Findings**

#### **Cornerstone: Mitigating Systems**

- Green. The inspectors identified a finding of very low safety significance associated with the failure to maintain control of the setpoints for constant level oilers. This condition increased the challenges to the proper functioning of the lubricating oil and thus to the bearings to the safety-related pumps.

This finding was considered more than minor because of the potential for the degradation of oil/bearings to safety-related components which would increase their unavailability and unreliability. This finding was of very low safety significance because no bearings had been damaged due to the high or low oil levels despite operating in this condition for many years and the oil had only been moderately impacted. The licensee's corrective actions included assessing the setpoints of other safety related and non-safety related pumps, verifying no pumps had been damaged, and revising the work order template to include the reference to the corporate procedure for the setting of constant level oilers. No violation of NRC requirements occurred. (Section 4OA2.3).

### **B. Licensee Identified Violations**

None

## **REPORT DETAILS**

### **Summary of Plant Status**

Unit 1 operated at or near full power throughout the inspection period with the following exception:

- On October 23, 2006, the unit returned to full power from a refueling outage that started on September 10, 2006.
- On October 25, 2006, the unit reduced power to 95 percent to swap feedwater pumps. The unit returned to full power on October 26, 2006.

Unit 2 operated at or near full power throughout the inspection period with the following exceptions:

- On October 21, 2006, the unit reduced power to 85 percent to perform turbine throttle and governor valve surveillances. The unit returned to full power on October 22, 2006.

### **1. REACTOR SAFETY**

#### **Cornerstone: Initiating Events, Mitigating Systems, Barrier Integrity and Emergency Preparedness**

##### **1R01 Adverse Weather Protection (711111.01)**

###### **a. Inspection Scope**

The inspectors reviewed the licensee's seasonal preparations for operation during the winter months. This was primarily accomplished by verifying that the licensee had completed the requirements for winter readiness as documented in Exelon Nuclear Administrative Procedure WC-AA-107, "Seasonal Readiness," Revision 2. The inspectors also reviewed the Updated Final Safety Analysis (UFSAR), Technical Specifications (TS) and other design-bases documents to identify those components that were susceptible to degradation from low temperatures during the winter months. The inspectors verified that the licensee had addressed these components in preparation for winter operation. In addition, the inspectors selected the following risk-significant support systems/areas for specific review:

- Essential Service Water Cooling Tower;
- Unit 1 and Unit 2 Condensate Storage Tanks; and
- River Screenhouse.

The inspectors also verified that the licensee had taken the appropriate actions for a predicted winter storm, including the potential for icing and severe cold temperatures. Specifically, the inspectors verified that the licensee had reviewed the impact of the weather against planned work activities, performed walkdowns of areas particularly

susceptible to cold weather conditions and discussed weather-related issues during the Operations Shift Turnover briefings and station Plan-of-the-Day meetings.

The inspectors also reviewed selected issue reports (IRs), interviewed plant personnel, and performed plant walkdowns. Documents reviewed as part of this inspection are listed in the Attachment to this report. This review constituted one sample for the onset of a site specific weather-related condition and three annual system review samples.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

.1 Partial Walkdowns

a. Inspection Scope

The inspectors performed one partial walkdown sample of accessible portions of trains of risk-significant mitigating systems equipment during times when the trains were of increased importance due to the redundant trains or other related equipment being unavailable. The inspectors utilized the valve and electric breaker lineups and applicable system drawings to determine that the components were properly positioned and that support systems were lined up as needed. The inspectors also examined the material condition of the components and observed operating parameters of equipment to determine that there were no obvious deficiencies. The inspectors used the information in the appropriate sections of the UFSAR and TS to determine the functional requirements of the systems.

The inspectors verified the alignment of the following:

- Unit 2 Train A Residual Heat Removal System while the Unit 2 Train B RHR Pump was Out of Service.

The inspectors also reviewed selected issues documented in IRs, to determine if they had been properly addressed in the licensee's corrective action program. The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.



1R05 Fire Protection (71111.05)

.1 Quarterly Walkdowns

a. Inspection Scope

The inspectors conducted fire protection walkdowns that were focused on availability, accessibility, and the condition of fire fighting equipment; the control of transient combustibles and ignition sources; and on the condition and operating status of installed fire barriers. The inspectors reviewed applicable portions of the Byron Station Fire Protection Report and selected fire areas for inspection based on their overall contribution to internal fire risk, as documented in the Individual Plant Examination of External Events Report.

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 that fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The Byron Station Pre-Fire Plans applicable for each area inspected were used by the inspectors to determine approximate locations of firefighting equipment.

The inspectors completed eight inspection samples by examining the plant areas listed below to observe conditions related to fire protection:

- Unit 1 Auxiliary Building Elevation 364' General Area (Zone 11.3-0);
- Unit 2 Train B Auxiliary Feedwater Pump Room (Zone 11.4A-1);
- Main Control Room (Zone 2.1-0);
- Unit 2 Lower Cable Spreading Room (Zone 3.2A-2);
- Unit 1 Division 12 ESF Switchgear Room (Zone 5.1-1);
- Unit 2 Train B Diesel Generator Room (Zone 9.1-2);
- Unit 1 Lower Cable Spreading Room (Zone 3.2A-1); and
- Unit 2 Turbine Building 426' General Area (Zone 8.5-2).

The inspectors reviewed selected issues documented in IRs, to determine if they had been properly addressed in the licensee's corrective action program. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's corrective action program. The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.2 Drill Observation

a. Inspection Scope

The inspectors assessed the fire brigade performance and the drill evaluator's critique during a fire brigade drill conducted on November 15, 2006. The drill simulated a fire in the Stores warehouse with participation from several offsite local fire departments.

The inspectors focused on command control of the fire brigade activities; fire fighting and communication practices; material condition and use of fire fighting equipment; and implementation of pre-fire plan strategies. The inspector also observed the communication, command and control and coordination between the onsite fire brigade and the offsite team of responders. The inspectors evaluated the fire brigade's performance using the licensee's established fire drill performance procedure criteria.

The inspectors also reviewed the qualification and training of the fire brigade and the required Appendix R fire fighting equipment. This inspection sample was started in our last report period and was completed in this report.

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

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06)

.1 External Flooding Review

a. Inspection Scope

The inspectors reviewed Byron's flood analysis and design basis documents to identify design features important to external flood protection, and reviewed the external flood protection measures in place to prevent or mitigate effects of the probable maximum flood and the probable maximum precipitation. This review included a general area walkdown of the outdoor plant area and perimeter to assess the condition and readiness of the plant drainage system components to perform their function during a probable maximum flood or probable maximum precipitation scenario.

This review represented one annual inspection sample. Documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.2 Internal Flooding Review

a. Inspection Scope

The inspectors evaluated the internal flooding controls for the following area:

- Auxiliary Building Elevation 364 around the Component Cooling Water Pumps including the covers over the Essential Service Water Pumps.

This review represented one inspection sample. Documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07A)

a. Inspection Scope

The inspectors completed one annual testing and performance review inspection sample by observing and evaluating the licensee's inspection of the following safety-related heat exchanger:

- Unit 1 Train A Essential Service Water Pump Oil Cooler Inspection.

The inspectors also reviewed selected issues documented in IRs, to determine if they had been properly addressed in the licensee's corrective action program. The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection Activities (71111.08)

.1 Piping systems Inservice Inspection Activities

a. Inspection Scope

From September 11, 2006 through September 15, 2006, the inspectors conducted a review of the implementation of the licensee's Risk-Informed (RI) ISI program for monitoring degradation of the reactor coolant system boundary and the risk significant piping system boundaries. The inspectors selected the licensee's RI-ISI program components and American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI required examinations and Code components in order of risk priority as identified in Section 71111.08-03 of the NRC Inspection Procedure, based upon the ISI activities available for review during the on-site inspection period.

The inspectors observed two types of nondestructive examination (NDE) activities, specifically Ultrasonic Examination and Visual Examination, to evaluate compliance with the ASME Code Section XI and Section V requirements and to verify that indications and defects (if present) were dispositioned in accordance with the ASME Code Section XI requirements. The following NDE activities were observed:

- Ultrasonic Examination of safety injection line welds 1SI01B-24-C03, 1SI01B-24-C04, 1SI01B-24-C05;
- Ultrasonic Examination of feedwater line weld 1FW87CA-6-C07A, a pipe to elbow weld; and
- Visual Examination of main steam pipe support snubber 1MS08007S1 and component cooling system pipe support snubber 1CC24013S.

There were no examinations with recordable indications that had been accepted by the licensee for continued service.

The inspectors reviewed a pressure boundary weld for a Class 1 system which was completed since the beginning of the previous refueling outage to determine if the welding acceptance and preservice examinations (e.g. visual, dye penetrant, and weld procedure qualification tensile tests) were performed in accordance with ASME Code Sections III, V, IX, and XI requirements. Specifically, the inspectors reviewed a weld associated with the following work activity;

- Repair (welding) of ISI Class 1 aux spray header check valve 1CV8377.

The inspectors performed a review of ISI-related problems that were identified by the licensee and entered into the corrective action program, conducted interviews with licensee staff and reviewed licensee corrective action records to determine if:

- the licensee had described the scope of the ISI-related problems;
- the licensee had established an appropriate threshold for identifying issues;
- the licensee had evaluated industry generic issues related to ISI and pressure boundary integrity; and
- the licensee implemented appropriate corrective actions.

The inspectors performed these reviews to ensure compliance with 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements. The corrective action documents reviewed by the inspectors are listed in the Attachment to this report.

The reviews as discussed above counted as one inspection sample.

b. Findings

No findings of significance were identified.

.2 Pressurized Water Reactor Vessel Upper Head Penetration Inspection Activities

a. Inspection Scope

Unit 1 is in the low susceptibility ranking category. No control rod drive mechanism NDE examinations were reviewed to be performed this outage. Therefore, no inspection sample was credited.

b. Findings

No findings of significance were identified.

.3 Boric Acid Corrosion Control (BACC) ISI

a. Inspection Scope

From September 11, 2006 through September 14, 2006, the inspectors reviewed the BACC inspection activities conducted pursuant to licensee commitments made in response to NRC Generic Letter 88-05 "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary."

The inspectors conducted a direct observation of BACC visual examination activities to evaluate compliance with licensee BACC program requirements and 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements. Specifically, on September 11, 2006, following the Unit 1 shutdown, the inspectors reviewed a sample of BACC visual examination activities through direct observation. This walkdown was begun with the Unit in Mode 3 at full operating pressure and temperature. The inspectors observed the visual inspections to determine if locations where boric acid leaks can cause degradation of safety significant components were emphasized.

The inspectors also reviewed the visual examination procedures and examination records for the BACC examination to determine if degraded or non-conforming conditions were properly identified in the licensee's corrective action system.

The inspectors reviewed the engineering evaluations performed for the following corrective action documents to ensure that ASME Code wall thickness requirements were maintained:

- IR 477473, component 1SI059A; Containment Recirc Sump to Containment Spray/Residual Heat Removal Test Connection Isolation Valve; and
- IR 306134; component 1 RC8029C; Unit 1 Loop C Reactor Coolant Bypass Vent Valve.

The inspectors also reviewed a number of boric acid leak corrective actions to determine if they were consistent with the requirements of the ASME code and 10 CFR Part 50, Appendix B, Criterion XVI. The documents reviewed during this inspection are listed in the Attachment to this report. These reviews counted as one inspection sample.

b. Findings

No findings of significance were identified.

.4 Steam Generator Tube ISI

Steam generator inspections were not scheduled to be performed this outage. Therefore, no inspection sample was credited.

.5 Identification and Resolution of Problems

The inspectors performed a review of ISI-related problems that were identified by the licensee and entered into the corrective action program, conducted interviews with licensee staff and reviewed licensee corrective action records to determine if;

- the licensee had described the scope of the ISI-related problems;
- the licensee had established an appropriate threshold for identifying issues;
- the licensee had evaluated operating experience and industry generic issues related to ISI and pressure boundary integrity; and
- the licensee implemented appropriate corrective actions.

The inspectors performed these reviews to ensure compliance with 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements. The corrective action documents reviewed by the inspectors are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Regualification (71111.11)

.1 Resident Inspector Quarterly Review

a. Inspection Scope

The inspectors completed one inspection sample by observing and evaluating the response to a steam generator tube rupture with a loss of pressurizer control. The inspectors evaluated crew performance in the areas of:

- Clarity and formality of communications;
- Ability to take timely actions;
- Prioritization, interpretation, and verification of alarms;
- Procedure use;
- Control board manipulations;
- Supervisor's command and control;
- Management oversight; and
- Group dynamics.

The inspectors verified that the crew completed the critical tasks listed in the above simulator guide. The inspectors also compared simulator configurations with actual control board configurations. For any weaknesses identified, the inspectors observed the licensee's evaluators to determine whether they also noted the issues and discussed them in the critique at the end of the session. The inspectors verified that minor issues were placed into the licensee's corrective action program.

The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.2 Facility Operating History

a. Inspection Scope

The inspectors reviewed the plant's operating history from October 2004 through October 2006 to identify operating experience that was expected to be addressed by the Licensed Operator Requalification Training (LORT) program. It was 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 ©, "Requalification program requirements."

The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.3 Licensee Requalification Examinations

a. Inspection Scope

The inspectors performed a biennial inspection of the licensee's LORT test/examination program for compliance with the station's SAT program which would satisfy the requirements of 10 CFR 55.59 © (4), "Evaluation." The reviewed operating examination material consisted of six operating tests, each containing two dynamic simulator scenarios and six job performance measures (JPMs). The written examinations reviewed consisted of four written examinations, each including a Part A, Plant and Control Systems and Part B, Administrative Controls / Procedure Limits. Each part of the exam contained 15 questions. The inspectors reviewed the annual requalification operating test and biennial written examination material to evaluate general quality, construction, and difficulty level. The inspectors assessed the level of examination material duplication from week-to-week during the current year operating test. The examiners assessed the amount of written examination material duplication from week-to-week for the written examination administered in 2006. The inspectors

reviewed the methodology for developing the examinations, including the LORT program 2-year sample plan, probabilistic risk assessment insights, previously identified operator performance deficiencies, and plant modifications.

The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.4 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 © (4), "Evaluation." The inspectors evaluated the performance of two crews 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 JPMs. 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 under Section 1R11.8, "Conformance With Simulator Requirements Specified in 10 CFR 55.46," of this report.

The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.5 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 to this report.

b. Findings

No findings of significance were identified.

.6 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 © "Requalification program requirements" and the licensee's SAT program.

The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.7 Licensee Remedial Training Program

a. Inspection Scope

The inspectors assessed the adequacy and effectiveness of the remedial training conducted since the previous biennial requalification examinations 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 © "Requalification program requirements" and with respect to the licensee's SAT program.

The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.8 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 seven licensed operators were reviewed for compliance with 10 CFR 55.53 (I).

The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.9 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 © and (d).

The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.10 Annual Operating Test Results and Biennial Written Examination Results

a. Inspection Scope

The inspectors reviewed the pass/fail results of the individual biennial written examinations, and the annual operating tests (required to be given annually per 10 CFR 55.59(a)(2)) administered by the licensee during calendar year 2006. The overall written examination and operating test results were compared with the significance determination process in accordance with NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process."

The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors completed three inspection samples by evaluating the licensee's implementation of the maintenance rule, 10 CFR 50.65, as it pertained to identified performance problems associated with the following structures, systems, and/or components:

- Testing of control switches used for shutdown outside of control room;
- Main Steam Safety Valve Enclosure Ventilation Damper Failures; and
- Unit 1 Train A Emergency Diesel Generator Relay Failures.

The inspectors evaluated the licensee's appropriate handling of structures, systems, and components (SSC) condition problems in terms of appropriate work practices and characterizing reliability issues. Equipment problems were screened for review using a problem oriented approach. Work practices related to the reliability of equipment maintenance were observed during the inspection period. Items chosen were risk significant, and the extent of condition was reviewed as applicable. Work practices were reviewed for contribution to potential degraded conditions of the affected SSCs. Related work activities were observed and corrective actions were discussed with licensee personnel. The licensee's handling of the issues being reviewed was evaluated under the requirements of the maintenance rule.

The inspectors also reviewed selected issues documented in IRs, to determine if they had been properly addressed in the licensee's corrective action program. The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed the licensee's management of plant risk during emergent maintenance activities or during activities where more than one significant system or train was unavailable. The inspectors chose activities based on their potential to increase the probability of an initiating event or impact the operation of safety-significant equipment. The inspectors verified that the evaluation, planning, control, and performance of the work were done in a manner to reduce the risk and the work duration was minimized where practical. The inspectors also verified that contingency plans were in place where appropriate.

The inspectors reviewed configuration risk assessment records, UFSAR, TS, and Individual Plant Examination. The inspectors also observed operator turnovers, observed plan-of-the-day meetings, and reviewed other related documents to determine that the equipment configurations had been properly listed, that protected equipment had been identified and was being controlled where appropriate, and that significant aspects of plant risk were being communicated to the necessary personnel.

The inspectors completed three inspection samples by reviewing the following activities:

- Unit 2 Train B Essential Service Water Pump Work Window while the Essential Service Water Basin Level was lowered for Repair;
- Unit 2 Train B Residual Heat Removal Pump Work Window while DC Bus 212 was cross-tied to DC Bus 112; and
- Unit 1 DC Bus 112 Battery Charger was out of service while System Auxiliary Transformer 142-2 was in a Work Window.

The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors evaluated plant conditions, selected condition reports, engineering evaluations, and operability determinations for risk-significant components and systems in which operability issues were questioned. These conditions were evaluated to determine whether the operability of components was justified.

The inspectors completed two inspection samples by reviewing the following evaluations and issues:

- Constant Level Oilers on Safety-Related Pumps Found without Setpoint Control; and
- Unit 2 Essential Service Water Damaged Outboard Thrust Bearing Housing.

The inspectors compared the operability and design criteria in the appropriate sections of the TS including the TS Basis, the Technical Requirements Manual (TRM) and the UFSAR to the licensee's evaluations to determine that the components or systems were operable. The inspectors determined whether compensatory measures, if needed, were taken, and determined whether the evaluations were consistent with the requirements of licensee procedures. The inspectors also discussed the details of the evaluations with the shift managers and appropriate members of the licensee's engineering staff.

The inspectors also reviewed selected issues documented in IRs, to determine if they had been properly addressed in the licensee's corrective action program. The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the post maintenance testing activities associated with maintenance or modification of mitigating, barrier integrity, and support systems that were identified as risk significant in the licensee's risk analysis. The inspectors reviewed these activities to determine that the post maintenance testing was performed adequately, demonstrated that the maintenance was successful, and that operability was restored. During this inspection activity, the inspectors interviewed maintenance and engineering department personnel and reviewed the completed post maintenance testing documentation. The inspectors used the appropriate sections of the TS, TRM, and UFSAR, and other related documents to evaluate this area.

The inspectors completed seven inspection samples by observing and evaluating the post maintenance testing subsequent to the following maintenance activities:

- Actuator Replacement of the Unit 1 Train B Diesel Generator (DG) room ventilation Damper, 1VD10YA;
- Replacement of Dual Zone Board for Fire Detection System Zone 1D-47/1D-48 & 1S-36;
- Unit 1 Train A Containment Recirculation Sump Outlet Isolation Valve (1SI8811A) Relay Replacement;
- Unit 2 Train A Residual Heat Removal Pump Work Window;
- Unit 1 Train A Essential Service Water Pump Oil Cooler Inspection;

- Unit 2 Train B Essential Service Water Pump Work Window; and
- Unit 1 Loop C Main Steam Safety Valve Enclosure Damper Modification.

The inspectors also reviewed selected issues documented in IR's to determine if they had been properly addressed in the licensee's corrective action program. The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities (71111.20)

a. Inspection Scope

The inspectors observed the licensee's performance during Refueling Outage B1R14 beginning September 10, 2006. The licensee returned the unit to full power on October 23, 2006. One inspection sample was completed for this report.

The inspectors evaluated the licensee's conduct of refueling outage activities to assess the licensee's control of plant configuration and management of shutdown risk. The inspectors reviewed configuration management to verify that the licensee maintained defense-in-depth commensurate with the shutdown risk plan; reviewed major outage work activities to ensure that correct system lineups were maintained for key mitigating systems; and observed refueling activities to verify that fuel handling operations were performed in accordance with the TS, TRM, UFSAR and approved procedures. The inspectors interviewed operations, engineering, work control, radiological protection, and maintenance department personnel during their inspection activities. The inspectors also attended outage-related status and pre-job briefings as well as Radiation Protection ALARA [As Low As Reasonably Achievable] briefings. Other major outage activities evaluated during this inspection period included evaluating the licensee's control of:

- containment penetrations in accordance with the TS;
- structures, systems or components (SSCs) which could cause unexpected reactivity changes;
- flow paths, configurations, and alternate means for reactor coolant system inventory addition;
- SSCs which could cause a loss of inventory;
- reactor coolant system pressure, level, and temperature instrumentation;
- spent fuel pool cooling during and after core offload;
- switchyard activities and the configuration of electrical power systems in accordance with the TS and shutdown risk plan; and
- SSCs required for decay heat removal.

The inspectors observed portions of the plant startup, including the approach to criticality and power ascension, to verify that the licensee controlled the plant startup in accordance with the TS and established procedures. In addition, the inspectors completed numerous visual inspections inside the Unit 1 containment. This included a tour of the Unit 1 containment at Mode 4 before plant startup so that the inspectors

could assess the material condition of equipment inside containment before containment closure. During the visual inspections the inspectors focused on the material condition of the equipment and housekeeping.

In addition, the inspectors evaluated portions of the restart preparation activities to verify that requirements of the TS and administrative procedure requirements were met prior to changing operational modes or plant configurations. Major restart inspection activities performed included:

- inspection of the containment building to assess material condition and search for loose debris, which if present, could be transported to the containment recirculation sumps and cause restriction of flow to the emergency core cooling system pump suctions during loss-of-coolant accident conditions.
- inspection of the licensee's approach to initial criticality, initial criticality, core reload physics testing, and turbine generator rolling and tie in to the off-site grid.

The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors witnessed selected surveillance tests and/or reviewed test data to determine that the equipment tested using the surveillance procedures met the TS, TRM, UFSAR and licensee procedural requirements. The inspectors also reviewed applicable design documents including plant drawings, to verify that the surveillance tests demonstrated that the equipment was capable of performing its intended safety functions. The activities were selected based on their importance in ensuring mitigating systems capability and barrier integrity.

These activities represented one routine and one Inservice Testing sample. The following surveillance tests were selected:

- 1BOSR 0.5-2.AF.1-1, "Stroke Time Testing for Auxiliary Feedwater System Valves 1AF013 A through D," Revision 3 (Inservice Testing sample); and
- 0BVSR 2.7.A.3, "Unit 0 Deep Well Pump Make-up Flow Verification," Revision 3.

Additionally the inspectors used the documents listed in the attachment to this report to determine that the testing met the frequency requirements; that the tests were conducted in accordance with procedures, that the test acceptance criteria were met; and that the results of the tests were properly reviewed and recorded. The inspectors verified that the individuals performing the tests were qualified to perform the test in accordance with the licensee's requirements, and that the test equipment used during

the test were calibrated within the specified periodicity. In addition, the inspectors interviewed operations, maintenance, and engineering department personnel regarding the tests and test results.

The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors completed two inspection samples by evaluating the following temporary plant modifications on risk significant equipment:

- Unit 1 B Loop Wide Range T-hot Temperature Indication; and
- Jumper to Defeat Slow Start Capability of the Unit 1 Train A Emergency Diesel Generator.

The inspectors reviewed this temporary plant modification to determine that the instructions were consistent with applicable design modification documents and that the modification did not adversely impact system operability or availability. The inspectors verified that the licensee controlled temporary modifications in accordance with Nuclear Station Procedure NSP CC-AA-112, "Temporary Configuration Changes," Revision 11.

The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

The inspectors completed a screening review of Revision 17 of the Byron Station Annex of the Exelon Standardized Emergency Plan to determine whether changes identified in this Annex revision may have reduced the effectiveness of the licensee's emergency planning. The screening review of Revision 17 does not constitute approval of the changes and, as such, the changes are subject to future NRC inspection to ensure that the emergency plan continues to meet NRC regulations.

These activities completed one inspection sample. The documents reviewed during this inspection are listed in the Attachment to this report.



b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

On October 23, 2006, the inspectors complete one inspection sample by observing an emergency preparedness drill. The inspectors assessed the licensee's drill performance and looked for weaknesses in the risk significance areas of emergency classification, notification and protective action development. The inspectors observed the licensee's performance from the simulator control room. The inspectors compared issues noted during their observations to those identified during the licensee's critique. Additionally, the inspectors verified that items identified during the licensee's critique were appropriately entered into their corrective action program.

The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

**2. RADIATION SAFETY**

**Cornerstone: Occupational Radiation Safety**

2OS1 Access Control to Radiologically Significant Areas (IP 71121.01)

.1 Inspection Planning

a. Inspection Scope

The inspectors reviewed the licensee Performance Indicator for the Occupational Exposure Cornerstone for followup. This review represented one sample.

b. Findings

No findings of significance were identified.

.2 Plant Walk Downs and Radiation Work Permit Reviews

a. Inspection Scope

The inspectors examined the licensee's physical and programmatic controls for highly activated or contaminated materials (non-fuel) stored within spent fuel and other storage pools. This review represented one sample.

b. Findings

No findings of significance were identified.

.3 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, Licensee Event Reports, and Special Reports related to the access control program since the last inspection. The inspectors assessed whether identified problems were entered into the corrective action program for resolution. This review represented one sample.

The inspectors assessed if the licensee's self-assessment activities were also identifying and addressing repetitive deficiencies or significant individual deficiencies in problem identification and resolution. This review represented one sample.

The inspectors reviewed licensee documentation packages for all Performance Indicator events occurring since the last inspection. The inspectors reviewed any of these Performance Indicator events that involved dose rates >25 R/hr at 30 centimeters or >500 R/hr at 1 meter and assessed what barriers had failed and if there were any barriers left to prevent personnel access. The inspectors reviewed unintended exposures >100 mem total effective dose equivalent (or >5 rem shallow dose equivalent or >1.5 rem lens dose equivalent) to assess if there were any overexposures or substantial potential for overexposure. This review represented one sample.

b. Findings

No findings of significance were identified.

.4 Job-In-Progress Reviews

a. Inspection Scope

The inspectors reviewed the adequacy of radiological controls, radiation protection job coverage (including audio and visual surveillance for remote job coverage), and contamination controls during job performance observations. This review represented one sample.

The inspectors reviewed the application of dosimetry to effectively monitor exposure to personnel for high radiation work areas with significant dose rate gradients (factor of 5 or more). This review represented one sample.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors discussed high dose rate-high radiation area and very high radiation area controls and procedures with the Radiation Protection Manager. The discussion focused on any procedural changes since the last inspection. The inspectors reviewed changes to licensee procedures and assessed that changes did not substantially reduce the effectiveness and level of worker protection. This review represented one sample.

The inspectors discussed with first-line radiation protection supervisors, or equivalent positions having backshift radiation protection oversight authority, the controls in place for special areas that have the potential to become very high radiation area during certain plant operations. The inspectors reviewed how the required communications between the radiation protection group and other involved groups would occur beforehand in order to allow corresponding timely actions to properly post and control the radiation hazards. This review represented one sample.

The inspectors verified adequate posting and locking of all entrances to all accessible high dose rate-high radiation areas and very high radiation areas. This review represented one sample.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES**

4OA2 Identification and Resolution of Problems (71152)

.1 Review of Items Entered into the Corrective Action Program:

As required by Inspection Procedure 71152, Identification and Resolution of Problems, and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed screening of all items entered into the licensee's corrective action program. This was accomplished by reviewing the description of each new Issue Report and attending selected daily management review committee meetings. Documents reviewed are listed in the Attachment to this report.

.2 Annual Sample - Operator Workarounds

a. Inspection Scope

The inspectors reviewed the licensee's ability to identify operator workarounds as well as the timeliness by which they were addressed. The inspectors conducted walkdowns of the plant in order to assess for any deficiencies in the plant that may prevent an operator from performing their job in a timely and safe manner. In addition, a thorough

records review was conducted which included the adverse condition monitoring program, the temporary configuration change log, the degraded equipment list, the approved operator aid list, and a historical review of issue reports for potential operator workarounds. Documents reviewed as part of this inspection are listed in Attachment to this report. This review represented one sample.

b. Assessment and Observations

The licensee's corporate procedure for classifying operator workarounds created the category of operator challenges which was differentiated from an operator workaround based on the challenge being an obstacle to normal plant operation while the workaround was described as an obstacle to emergency or safe plant operation (TS/safety-related equipment). There were two items classified as operator challenges and one identified operator workaround. The inspectors noted that the use of a separate category for operator challenges was an acceptable management tool. However, it may have created a vulnerability allowing the licensee to rationalize not always addressing operational issues in a timely manner. Interviews with operators determined that they liked the two tier system as they felt it allowed for a lower threshold of items to be added to the operators' challenges list and they had not observed a decline in the timeliness of addressing operational issues.

c. Findings

No findings of significance were identified.

.3 Semiannual Review to Identify Trends

a. Inspection Scope

The inspectors performed a review of the licensee's Corrective Action Program (CAP) and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment and corrective maintenance issues with additional insights from the daily inspector CAP item screening discussed in Section 4OA2.1. The review also included issues documented outside of the normal CAP including focus area self-assessments, corrective maintenance backlog reports, common cause analysis reports, component status reports, and maintenance rule assessments. The inspectors' review nominally considered the 6-month period of July 2006 through December 2006, although examples expanded beyond those dates when the scope of the trend warranted. The inspectors compared and contrasted their results with the results contained in the licensee's mechanisms for identifying and correcting trends.

The review was accomplished by grouping IRs into broad categories during the daily screenings. These groups included, but were not limited to, items involving the same issue, same equipment/components, or the same program. This activity completed one sample.

b. Findings and Observations

Finding Introduction: A finding of very low safety significance (Green) was identified when the inspectors identified the licensee failed to maintain setpoint control of the constant level oilers. This condition increased the challenges to the proper functioning of the lubricating oil and thus to the bearings of the safety-related pumps. This finding was of very low safety significance because no bearings had been damaged due to the high or low oil levels despite operating in this condition for many years and the oil had only been moderately impacted.

Finding Description: The inspectors observed that the constant level oilers on the five safety-related component cooling water pumps (CCW) were all set at different heights with respect to their associated bearings. The vendor recommended that the bearings should not be submerged more than one-half the diameter of the bearing. Since the bearing diameter was small (less than one half inch) and the largest variation between setpoints was 3/8" there was a possibility that the setpoints were not correct. Low oil level can result in an insufficient amount of oil to the bearing. High oil levels can cause air to be pushed into the oil resulting in frothing, and thinning of the oil, which can cause inadequate heat removal and bearing damage. The licensee wrote IRs 555893 and 555201 to address this concern. The licensee also stated that, although they were in the process of reducing oil leaks and had determined that some constant level oilers had been installed on the wrong side of the pumps, they had not noticed the setpoint variation.

Licensee personnel determined that there was a corporate procedure, MA-AA-734-400, for setting the level of the constant level oilers but had also determined that they had not incorporated the procedure into maintenance work packages. The licensee performed a review and determined that, while there was a potential to damage the pump bearings due to either high or low oil levels, no history bearing damage that could be attributed to improper oil levels.

The licensee implemented corrective actions to assess the setpoint including:

- incorporating MA-AA-734-400 into work packages;
- training operators how to recognize the setpoint of the oilers;
- assessing the setpoints of other safety-related pumps; and
- incorporating the setpoint assessment into the leak reduction efforts.

Finding Analysis: The inspectors determined that the failure to have setpoint control of the safety-related constant level oilers was a performance deficiency warranting a significance evaluation in accordance with Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Disposition Screening," issued September 30, 2005. This finding was considered more than minor because of the potential for degradation of oil/bearings to safety-related components that would increase their unavailability and unreliability.

The inspectors performed a phase 1 significance determination of this issue, using IMC 0609, "Significance Determination Process," dated November 22, 2005, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power

Situations,” dated November 22, 2005. As stated the failure to have setpoint control of the constant level oilers was a performance deficiency that could affect the core decay heat removal system and was considered more than minor. This met the mitigating systems cornerstone screening criteria as discussed in IMC 0609 Appendix A.

In accordance with IMC 0609, Appendix A, Attachment 1, the inspectors determined that this finding should be screened as Green. Specifically because the finding did not result in a Loss of Operability, did not result in a loss of system safety function, did not result in an actual loss of safety function of a single Train for greater than its TS Allowed Outage Time, did not represent an actual loss of safety function of one or more non-TS trains of equipment designated as risk-significant, and was not related to a seismic, flooding or severe weather initiating events. Therefore, the inspectors concluded that this finding was of very low safety significance (Green) (FIN 05000454/2006005-01; 05000455/2006005-01)

Finding Enforcement: The inspectors concluded that no violation regulatory requirements had occurred as there was no procedure requirement in the maintenance work packages to check/adjust the constant level oiler setpoints, no significant oil degradation had occurred, and no bearings had been damaged due to the lack of setpoint control.

Observations: The inspectors determined that licensee employees were writing IRs with a low threshold, that employees at all levels of the organization were writing IRs, and that IRs were written for all issues of significance. Collectively, this provided one indication of a safety conscious work environment.

The licensee identified a number of trends. Each trend was documented in an IR and evaluated to determine if a common cause evaluation was necessary. The licensee-identified trends were identified by a combination of the work groups involved with the issues, department or station corrective action program coordinators, department managers, and the nuclear oversight group. This indicated that multiple groups were looking for and identifying meaningful trends.

The inspectors did not identify any new trends or potential trends that had not been already identified by the licensee. The inspectors identified a trend in the area of procedural adherence but noted that the licensee had already identified this trend and initiated corrective actions. The inspectors did note several examples of IRs written which did not identify the procedural adherence aspects of the issues. In all cases the procedural adherence aspect was of minor safety significance in accordance with the guidance provided in IMC 0612. Examples included:

- On January 4, 2006, the Unit 1 Train B (1B) DG was being operated for a routine surveillance. The operators did a prompt controlled shutdown of the DG when the right bank air intake manifold temperature started swinging and reached 162°F. This exceeded the procedural limit of 160°F. A note in the surveillance procedure (BOP DG-11T2) stated that the DG was to be tripped if the procedural limit of 160°F was exceeded. IR 438719 was written addressing the cause of

the high temperature and performed an operability assessment. This IR did not address the operators' performance of an immediate shutdown of the DG instead of tripping the DG as required by procedure.

As the procedural limit of 160°F was for normal mode only and was not a limit required to be followed when the DG was started in the emergency mode and as the operability assessment determined the DG would have been able to meet design requirements at the increased temperature this failure to follow procedure was a minor violation in accordance with the guidance provided in IMC 0612.

During the followup to this issue the inspectors noted other IRs on a similar condition. For example, IR 350579 noted a problem with the 1B DG intake manifold temperature swinging in July 2005 and problems were noted with the air intake manifold temperature swinging in September 2000 on the 1A DG.

- During the review of IR 571193, regarding a design problem with containment radiation monitor 2PR11J the inspectors noted a procedural adherence issue. The IR addressed a problem achieving the procedurally required high flow rate during a calibration check of flow control switch 2FS-PR135. During the calibration the instrument mechanics (IM) were required to get the air flow through the flow switch up to 3.1 scfm [standard cubic feet per minute]. The IMs were unable to reach the required flow rate without loosening the particulate channel filter plug. This method of reaching the required flow rate was not called out in the calibration procedure (BISR 4.15.4-200). Moreover, the calibration procedure assumed the filter was partially plugged if the flow rate was not reached and directed the IMs to replace the filter. This issue has existed since the equipment was originally installed and the IMs routinely loosened the particulate channel filter plug instead of replacing the filter.

The IR written to address this concern recognized and corrected the need to replace the filters, however, it did not address the concern regarding the IMs failure to follow the procedure by loosening the filter plug to obtain the specified flow rate. This failure to follow procedure was a minor violation in accordance with the guidance provided in IMC 0612 because the calibration verified that upon a high flow condition the associated control valve would return the flow rate to the required value. The design issues which prevented the flow from reaching the required high value did not affect the instrument's ability to perform its intended safety function.

The licensee had already recognized the need to focus on site wide procedure adherence before the inspectors had identified the apparent trend. Procedure adherence had been entered into the Human Performance Excellence Plan along with all of the individual IRs associated with procedural adherence. The licensee generated IR 577579 to formally document the site wide improvement initiative.

#### 4OA3 Event Follow-up (71153)

##### .1 (Closed) LER 454-2006-003-00: Inadvertent Exceeding of TS Action Requirement Completion Time for Containment Spray Additive System Due to Not Recognizing an Inoperable Condition

On August 11, 2006, the licensee identified a pressure boundary weld leak in an ASME Class II pipe of the spray additive system. However, it was not until September 11, 2006, that the licensee recognized that the leak rendered the spray additive system inoperable. Therefore, the licensee failed to repair the leak within 7 days as required by TS 3.6.7. Subsequently, the licensee declared the system inoperable and repaired the leak. Other corrective actions included the development of a new component leak template to convey operability information to shift management and a training improvement plan for operability determination on issue reports. The violation is of very low safety significance because the system does not affect core damage frequency and has no impact on Large Early Release Frequency. This licensee-identified finding involved a violation of TS 3.6.7. The enforcement aspects of the violation were discussed in NRC Inspection Report 05000454/2006003. This LER is closed.

#### 4OA5 Other Activities

##### Mitigating Systems Performance Index Verification (Temporary Instruction 2515/169)

###### a. Inspection Scope

The Mitigating System Performance Index (MSPI) was developed to replace the Safety System Unavailability (SSU) indicators previously in use in the Reactor Oversight Process (ROP). The MSPI monitors the unavailability and the unreliability of the same four safety systems that comprise the SSU and it also monitors the cooling water support systems for those four safety systems. The index measures the performance of risk significant functions of these safety systems and was based on plant specific probability risk assessment (PRA) model. The purpose of this Temporary Instruction was to validate the unavailability and unreliability input data and to verify accuracy of the first reporting results for the 2006 2nd quarter.

The inspectors reviewed the licensee's basis document and evaluated the implementation of the MSPI against the guidance provided in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 4. The inspectors reviewed selected surveillances that do not render the safety system train unavailable due to short duration of the surveillance or due to credit for operator recovery activities, as defined by NEI 99-02. The inspectors also performed independent verification of selected unavailability and unreliability data using operating logs, maintenance rule record, and condition reports to confirm that the actual data reported was accurate.



b. Evaluation of Inspections Requirements

1. For the sample selected, did the licensee accurately document the baseline planned unavailability hours for the MSPI systems?

The inspectors identified that the licensee had prepared two sets of baseline data in their basis document. One set of data consisted of the unavailability data from July 2002 to June 2005 and another set of data consisted of the unavailability data from January 2002 to December 2004. However, the data set from July 2002 to June 2005 was used to calculate the reported MSPI. The inspectors determined that this was not in accordance with the NEI 99-02 guidance, which specified using data from January 2002 to December 2004.

At the close of the inspection period the licensee was in the process of revising the basis document and recalculating the MSPI using the unavailability data set from January 2002 to December 2004. This re-evaluation was not expected to cause the MSPI to change indicated index color and the change was expected to be incorporated in the 4th quarter 2006 performance indicators.

2. For the sample selected, did the licensee accurately document the actual unavailability hours for the MSPI systems?

The inspectors identified numerous instances in several MSPI systems that the unavailability hours were not accurately determined. However, the magnitude of the data discrepancies was small and did not significantly affect the calculated MSPI. For example, on a few occasions, the licensee failed to include short duration periods of planned unavailability for maintenance. As part of the corrective actions, the licensee was performing a comprehensive data review to ensure the unavailability hours were accurately reflected in the index. It was expected that the review would be completed and incorporated any changes into the 4th quarter 2006 performance indicators.

3. For the sample selected, did the licensee accurately document the actual unreliability information for each MSPI monitored component?

The inspectors identified several instances where failure information for the emergency diesel generator was not being documented appropriately. These discrepancies were related to the capability of the opposite unit's diesel generators to support a loss of offsite power (LOOP) in the monitored unit. The Byron PRA assumed the availability of opposite unit diesel generators for certain accident scenarios and that is reflected in the MSPI basis document.

According to the NEI guidance, the number of emergency AC power system trains for a unit is equal to the number of class 1E emergency generators that are available to power safe-shutdown loads in the event of a loss of offsite power for that unit. Since all the diesel generators at Byron Station can supply all units, the number of train is equal to the number of diesel generators. Therefore, for the Byron Station, four trains of diesel generators were being monitored.

The inspectors identified several past failures that affected the test mode (or manual mode) of operation of the diesel generators. These failures either prevented the diesel generator from starting in the manual mode or tripped the diesel generator during test. The licensee determined that these failures were spurious operation of a trip that would be bypassed in a loss of offsite power event and therefore the diesel generators were not considered to have failed.

The licensee also stated that the opposite unit diesel generators would only be required to function during a dual unit loss of offsite power event. In that situation, the opposite unit diesel generators would auto-start in the emergency mode instead of the manual mode.

The inspectors disagreed with the licensee's determination for the following reasons:

- 1) The function monitored for the emergency AC power system is the ability of the emergency generators to provide AC power to the class 1E buses following a loss of offsite power event on that unit. Four trains of diesel generators are providing this risk significant MSPI function per the NEI guidance. Under a LOOP event, the two diesel generators associated with the LOOP unit will be auto-started in emergency mode. However, the opposite unit diesel generators have to be started in test mode (manual) to provide AC power to the LOOP unit.
- 2) Per the NEI guidance, no credit is given for the achievement of a monitored function by an unmonitored system in determining unavailability or unreliability of the monitored systems. Therefore, the licensee could not take credit for the opposite unit buses to provide AC power. The licensee must be able to manually start the opposite unit diesels to provide power to the LOOP unit.
- 3) According to the Byron MSPI basis document, the opposite unit diesel generators were risk significant and the Maintenance Rule functions of providing test mode capability and local start and control capability were within the scope of MSPI.
- 4) The Byron PRA assumed the opposite unit diesel generators were available to supply power to the monitored unit under certain scenarios.

This issue is being addressed through the Performance Indicator FAQ [frequently asked question] process.

4. Did the inspector identify significant errors in the reported data, which resulted in a change to the indicated index color? Describe the actual condition and corrective actions taken by the licensee, including the date when the revised PI information was submitted to the NRC.

The inspectors did not identify significant errors in the reported data, which resulted in a change to the indicated index color. As described in Question 1, 3 and 4, the licensee was reviewing the data accuracy for MSPI and was expected to have this completed in January 2007. No change in indicated index color was

expected from this review. The inspectors will perform verification of the change as part of the ongoing performance indicator verification process of the ROP.

5. Did the inspector identify significant discrepancies in the basis document which resulted in (1) a change to the system boundary; (2) an addition of a monitored component; or (3) a change in the reported index color? Describe the actual condition and corrective actions taken by the licensee, including, the date of when the bases document was revised.

The inspectors did not identify significant discrepancies in the basis document which resulted in either a change to the system boundary, an addition of a monitored component or a change in the reported index color. The inspectors did identify an implementation error in the treatment of an installed spare component. This error resulted in additional unavailability hours in the baseline data and current data. That implementation error was corrected in the basis document during the inspection period. Currently, reported data was undergoing a comprehensive review by the licensee but the discrepancy was not expected to cause any change in index color, system boundaries or monitored components. In addition, a FAQ is being submitted to clarify the treatment of test failures for the opposite unit diesel generators to provide power.

c. Findings

No findings of significance were identified.

4OA6 Meetings

- .1 On January 16, 2007, the resident inspectors presented the inspection results to Mr. D. Hoots and his staff, who acknowledged the findings. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

.2 Interim Exit Meetings

Interim exits were conducted for:

- Inservice Inspection Activities Inspection with Mr. D. Hoots and other members of licensee management on September 15, 2006. The inspectors returned proprietary information reviewed during the inspection and the licensee confirmed that none of the potential report input discussed was considered proprietary.
- Occupational radiation safety program for access control to radiologically significant areas and As-Low-As-Is-Reasonably-Achievable Planning And Controls (ALARA) programs inspections with Mr. D. Hoots on September 15, 2006.
- Biennial Operator Requalification Program Inspection with Mr. D. Hoots on November 3, 2006.

- Biennial Operator Requalification Program Inspection with Mr. S. Gackstetter, Operations Training Supervisor, and Mr. R. Williams, Training Instructor, on November 28, 2006, via telephone.
- Emergency Preparedness inspection with Mr. D. Drawbaugh, Emergency Preparedness Manager, on December 27, 2006.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

D. Hoots, Site Vice President  
M. Snow, Plant Manager  
B. Adams, Work Control Director  
B. Barton, Radiation Engineering Superintendent  
Z. Cox, Chemistry  
L. Doyle, Programs Coordinator  
D. Drawbaugh, Emergency Preparedness Manager  
S. Fruin, Operations  
S. Gackstetter, Operations Training Supervisor  
A. Giancattarino, Engineering Director  
C. Gregory, RP Instrumentation Coordinator  
B. Grundmann, Regulatory Assurance Manager  
E. Hernandez, Maintenance  
T. Hulbert, NRC Coordinator  
W. Kouba, NOS Manager  
J. Langan, Regulatory Assurance  
R. McBride, ISI Engineer  
D. Palmer, Radiation Protection Manager  
M. Prospero, Operations Manager  
P. Reister, Work Control  
C. Settles, IEMA, Springfield  
J. Smith, Acting Engineering Programs Manager  
S. Stimac, Acting Training Manager  
S. Swanson, Maintenance Director  
D. Palmer, Radiation Protection Manager,  
M. Prospero, Operations Manager  
C. Thompson, IEMA, Byron Station  
D. Thompson, Technical Support Superintendent  
R. Williams, LORT Instructor Training

#### Nuclear Regulatory Commission

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

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened

None

### Opened and Closed

05000454/2006005-01	FIN	Failure to have setpoint control of the constant level
05000455/2006005-01		oilers on safety-related pumps

### Closed

05000454/2006-003-00	LER	Inadvertent Exceeding of TS Action Requirement Completion Time for Containment Spray Additive System Due to Not Recognizing an Inoperable Condition
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### Discussed

None

## **LIST OF DOCUMENTS REVIEWED**

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

### 1R01 Adverse Weather Protection

0BOSR XFT-A1; Freezing Temperature Equipment Protection SH and Department Support Requirements, Revision 9  
0BOSR XFT-A2; Freezing Temperature Equipment Protection Auxiliary Steam Boilers, Revision 1  
0BOSR XFT-A3; Winter Readiness Surveillance Discrepancies, November 19, 2006  
0BOSR XFT-A5; Freezing Temperature Equipment Protection Non-Protected Area Buildings Ventilation Systems, Revision 2  
Byron Station Test Report; Condensate Storage Tank Temperature Indicating Switch 1TIS-CD053, Revision 1  
IR 561806; PWST Heater Vent Caps Are Not Per Design, November 20, 2006  
IR 561812; Unexplained Unit 2 CST Level Perturbations, November 25, 2006  
IR 562347; Unit 2 CST Heaters Need Draining, November 27, 2006  
IR 562348; Unit 0A PWST Heaters Need Draining and New Vent Caps, November 27, 2006  
IR 562351; Unit 0B PWST Heaters Need Draining and New Vent Caps, November 27, 2006  
IR 564343; Unit 1 CST Heaters Need Draining, November 27, 2006  
IR 567089; River Screen House Temperature Alarm Comes in Early, December 08, 2006  
IR 567427; Potential for Freezing Pipes, December 10, 2006

### Corrective Action Documents as a Result of NRC Inspection

IR 560928; Loose Debris Around SX Tower During Fan Replacement Project, November 21, 2006 (NRC Identified)

### 1R04 Equipment Alignment

BOP RH E2A; Residual Heat Removal System, Unit 2 Electrical Lineup, Revision 3  
BOP RH-M2A; Train "A" Residual Heat Removal System Valve Lineup, Revision 6

### 1R05 Fire Protection

IR 543978; Print Not Updated to Reflect a Change in Fire Seal Status, October 14, 2006  
IR 559556; Lessons Learned From Offsite Fire Drill, November 17, 2006  
Pre Fire Plan; "Auxiliary Building Elevation 383'-0" - Zone 11.4A-2"  
Fire Safety Analysis Report; Section 2.3.11.31, "Unit 2 Auxiliary Feedwater Diesel - Driven Pump Room," Fire Zone 11.4A-1  
Fire Safety Analysis Report; Section 2.3.11.32, "Unit 2 Auxiliary feedwater Diesel-Driven Pump Room," Fire Zone 11.4A-2

6E-Q-4Q30VA61; "Diesel Driven Auxiliary Feedwater Pump & Day Tank Room CO2 Fire Protection System Fire Damper Control  
 Catalog ID#23764; "Linkage, thermal, Electro, 165 DEG. F. Melting Point  
 Fire Safety Analysis Report; Section 2.3.11.12, "Auxiliary Building General Area Level 364 feet 0 inches, " Fire Zone 11.3-0  
 Pre Fire Plan; "Auxiliary Building Elevation 364' - 0 Basement Floor Zone 11.3-0 West, North, and South  
 Fire Drill Scenario No. 37; Stores Warehouse w/Offsite Assistance, November 10, 2006  
 Pre Fire Plan; Unit 2 Lower Cable Spreading Room, Zone 3.2A-2  
 Pre Fire Plan; Unit 2 Lower Cable Spreading Room, Zone 3.2B-2  
 Pre Fire Plan; Unit 2 Lower Cable Spreading Room, Zone 3.2D-2  
 Pre Fire Plan; Unit 1 Lower Cable Spreading Room, Zone 3.2A-1  
 Pre Fire Plan; Unit 2 Turbine Building Elevation 426; Zone 8.5-2 Northwest  
 Pre Fire Plan; Unit 2 Turbine Building Elevation 426; Zone 8.5-2 Northeast  
 Pre Fire Plan; Unit 2 Turbine Building Elevation 426; Zone 8.5-2 Southwest  
 Pre Fire Plan; Unit 2 Turbine Building Elevation 426; Zone 8.5-2 Southeast  
 Fire Protection Report Appendix 5.2; Cable Systems Criteria, December 1990  
 IEEE 634-1978; IEEE Standard Cable Penetration Fire Stop Qualification Test  
 Transco Test Report No. TR-159; Fire and Hose Stream Tests of TCO-001 Cement Used in Electrical Conduit Penetrations, November 15, 1984  
 Fire Test 6510-001; Fire and Hose Stream Test of Nine Penetration Seal Systems, August 1986  
 ASTM E119; Standard Test Methods for Fire Tests of Building Construction and Materials  
 Drawing FPS-724-BY; Fire Barrier Penetration Seal Surveillance; Revision A  
 Drawing FPS-740-BY; Fire Barrier Penetration Seal Surveillance; Revision A  
 Drawing 6E-0-3905, Revision U, Fire Detection Grade Floor at El. 401'-0" Byron  
 Drawing 6E-0-3906, Revision P, Fire Detection Mezzanine Floor at El. 426'-0" Byron  
 Drawing 6E-2-3331, Revision BR, Electrical Installation Auxiliary Building Plan El. 401'-0", Columns L-Q

#### Corrective Action Documents as a Result of NRC Inspection

IR 540438; NRC Question Concerning Fire Barrier on 383' Elevation, October 5, 2006 (NRC Identified)  
 IR 545892; NRC Issue Identified for 0LL077E; October 18, 2006 (NRC Identified)  
 IR 546853; Pre-Fire Plan/Fire Protection Plan/Plant Discrepancy, October 20, 2006 (NRC Identified)  
 IR 574929; Issues with Fire Pre-Plans, December 22, 2006 (NRC Identified)

#### 1R06 Flood Protection Measures

UFSAR Section 3.4, Water Level (Flood) Design; Revision 10, December 2006  
 IR 557177; Revise 0BMSR DD-1 To Update Acceptance Criteria, November 13, 2006  
 IR 557186; 0BMSR DD-1 Add to Model Work Orders, November 13, 2006  
 IR 563669; 2A SX Sump Pump Discharge Valve 2WF040A is Leaking, November 30, 2006



## Corrective Action Documents as a Result of NRC Inspection

IR 559022; Uncapped SX Drain line Above Unit 2 CC Pump Motors, November 16, 2006  
(NRC Identified)

### 1R07 Heat Sink Performance

WO 948789 01; 1SX01AA - Heat Exchanger Inspection per Generic Letter 89-13,  
November 21, 2006  
BVP 800-30; Service Water System (Essential Service Water) Fouling Monitoring Program,  
Revision 9

### 1R08 Inservice Inspection Activities

#### NDE Procedures

EXE-PDI-UT-1; Ultrasonic Examination of Ferritic Pipe Welds in Accordance with PDI-UT-1;  
Revision 5  
EXE-PDI-UT-2; Ultrasonic Examination of Austenitic Pipe Welds in Accordance with PDI-UT-2;  
Revision 5  
ER-AA-335-016; VT-3 Visual Examination of Component Supports, Attachments and Interiors  
of Reactor Vessels; Revision 3  
PDI Piping and Bolting Program; Krautkramer Model USN-58Lsw and USN-60sw; October 6,  
2005  
TQ-AA-122; Qualification and Certification of Nondestructive (NDE) Personnel; Revision 2

#### Head Exam

ER-AP-331; Boric Acid Corrosion Control (BACC) Program; Revision 2  
ER-AP-331-1003; RCS Leakage Monitoring and Action Plan; Revision 0  
ER-AP-331-1004; Boric Acid Corrosion Control (BACC) Training and Qualification; Revision 1

#### NDE Exam Documents

WO 00816082-66; OBS #14-194, 195, 196: ISI Examination Summary; UT Weld Inspection  
Report; November 11, 2006  
WO 00731033; VT-3 Examination Report for Snubbers 1MS08007-S1 and 1CC24013S;  
September 14, 2006  
WO 00831572; Determine Unit 1 EDY (NRC Order EA-03-009); August 21, 2006  
WO 00650401; Unit 1 ASME Section XI Pressure Test (Class 1) - Post Refuel; March 17, 2005  
ISO MS-15; Large Bore Isometric Main Steam (MS) System; Revision 9  
ISO CC-40; SYS-Component Cooling Sta-Byron Unit-1; Revision E  
Equipment Equivalence; Krautkramer Model USN-58Lsw and USN-60sw; October 6, 2005

#### Corrective Action Documents

IR 296825; Work Order Scope Change not Reviewed Through RRR Process: February 2,  
2005

IR 504160; Deficiencies Identified During ISI Programs FASA; June 27, 2006  
IR 307161; Incorrect Size (Class-D) Snubber "1SD21033S"; March 2, 2005  
IR 453027; ER-AA-335-030 Rev. 2 Comments; February 12, 2006  
IR 372536; VT-2 PMT Discrepancy; September 12, 2005  
IR 453301; U-1 SFP HX Outlet Isolation Valve; February 13, 2006  
IR 453320; U-1 RCP Seal Inj. Header Vent Valve; February 13, 2006  
IR 455325; U-1 Pressurizer Liquid Sample Vent Conn Isolation Valve; February 17, 2006  
IR 462938; 1A CV EENT Chg PP; March 7, 2006  
RS-06-117; Clarification of Relaxation Request for First Revised Order (EA-03-009); August 28, 2006  
B1R13 Control Rod Drive Mechanism Volumetric Examinations; Discussions of Significance of Surface Scratches Found on reactor Vessel Upper Head Penetrations; June 23, 2005

#### Welding Documents

WO00706874-01; U-1 Pressurizer 1RY01S Auxiliary Spray Header Check Valve;  
August 23, 2004

#### Corrective Action Documents as a Result of NRC Inspection

IR00379827; Overly Conservative Use of Recordable Indication per IWF; September 29, 2006 (NRC Identified)  
IR 531366; Numerous Housekeeping Concerns in Unit 1 Refueling Water Storage Tank Tunnel, September 14, 2006 (NRC Identified)

#### 1R11 Licensed Operator Requalification Program

Byron ROP Plant Issue Matrix from June 1, 2004 to October 11, 2006; October 11, 2006  
Byron Station, Units 1 and 2 NRC Integrated Inspection Reports; dated various from November 6, 2004 through August 3, 2006  
LER 454-2005-004-00; TS Required Action Not Satisfied Due to Ambiguous Implementing Procedure; May 24, 2005  
Seven Licensed Operators' Medical Records; dated various  
FASA AT 370526; Focused Area Self-Assessment Report; Byron Licensed Operator Requalification Training; May 8, 2006 through May 12, 2006  
FASA AT 390926; Focused Area Self-Assessment Report; Operations Training Program Comprehensive Self-Assessment; May 17, 2006  
IR 494164; UFSAR Time-Critical Task Evaluation Results - Loss of All AC; May 26, 2006  
IR 502730; Licensed Operator Time Critical Task Evaluation -SGTR, June 22, 2006  
IR 507358; UFSAR Time-Critical Task Evaluation Results - Cold Leg Recirc; July 7, 2006  
Completed TQ-AA-210-4101; Remedial Training Notification and Action on Failure; various from September 10, 2004 through October 13, 2006  
Licensed Operator Requalification Long Range Training Plan; 2005 through 2006  
Completed TQ-AA-106-0102; Licensed Operator Requal Training Classroom Attendance Sheet; dated various  
Completed TQ-AA-106-0103; Licensed Operator Requal Training (Simulator Attendance); dated various  
Completed TQ-AA-210-5101; Training Observation Form; dated various

Completed TQ-AA-210-5103; Trainee Reaction - Multiple Topic; dated various  
 Completed TQ-AA-210-5106; LORT Evaluation Summary; dated various from June 27, 2004 through July 16, 2006  
 Completed TQ-AA-106-113; Simulator Demonstration Examination Individual Competency Form; dated various  
 Completed TQ-AA-106-114; Simulator Demonstration Examination Crew Competency Form; dated various  
 Completed TQ-AA-106-116; Licensed Operator Requal Training JPM Evaluation Summary; dated various  
 Completed OP-AA-105-102; Attachment 1; Active License Tracking Log; dated various  
 Completed OP-AA-105-102; Attachment 2; Reactivation of License Log; dated various  
 2004 Byron Station Licensed Requalification Exam Report  
 2005 Byron Station Licensed Requalification Exam Report  
 TQ-AA-106; Licensed Operator Requal Training Program; Revision 8  
 TQ-AA-106-0302; Licensed Operator Training Simulator Training Scenario Development Job Aid; Revision 0  
 TQ-AA-106-0303; Licensed Operator Training Job Performance Measure Development Job Aid; Revision 2  
 TQ-AA-106-0304; Licensed Operator Training Exam Development Job Aid; Revision 7  
 TQ-AA-106-0307; Licensed Operator Requal Training Cycle Simulator Evaluation Job Aid; Revision 1  
 TQ-AA-201; Examination Security and Administration; Revision 8  
 TQ-AA-204; Training Management System; Revision 0  
 TQ-AA-301; Simulator Configuration Management; Revision 6  
 TQ-AA-301-0301; Simulator SWR Prioritization Maintenance, Modification, and Enhancements; Revision 2  
 TQ-AA-302; Simulator Testing and Documentation; Revision 6  
 TQ-AA-303; Controlling Simulator Core Update and Thermal-Hydraulic Model Updates; Revision 4  
 TQ-BY-302-0101; Byron Plant-Referenced Simulator Certification Plan; Revision 0  
 Byron Simulator and Plant Differences; Training Load BY0604.00  
 ANSI/ANS-3.5-1985; Nuclear Power Plant Simulators for Use in Operator Training; October 25, 1985  
 Regulatory Guide 1.149; Nuclear Power Plant Simulation Facilities for Use in Operator License Examinations; Revision 1; April 1987  
 Simulator Malfunction Tests; dated various  
 Simulator Transient Tests; dated various  
 Simulator Steady State Tests; dated various  
 Simulator Core Performance Tests; dated various  
 Simulator Review Board Meeting Minutes; dated various from January 6, 2005 through October 19, 2006  
 Simulator Testing Review Board Meeting Minutes; dated various from June 24, 2005 through June 24, 2006  
 List of Open Simulator Work Requests; October 27, 2006  
 Open SWR 7701; DEHC Upgrade - TV/GV Test Response; April 7, 2005  
 Open SWR 8869; 1SA033 IA Supply Appears to be from Aux Bldg vs. Containment; April 18, 2006  
 Open SWR 9150; CV System Flow Oscillation; July 24, 2006

Open SWR 9360; LTOP Lift Setpoint Changes Due to PTLR Revision; September 25, 2006  
 List of Closed Simulator Work Requests for Last 12 Months; October 27, 2006  
 Closed SWR 6302; 1SA033 and 1IA066 Improper Response to MF-RP04; June 7, 2004  
 Closed SWR 7511; Add Malfunction for Loss of MPT Cooling; February 16, 2005  
 Closed SWR 7915; Compare Data from 2B FW Pump trip to Simulator for STRB; June 3, 2005  
 Closed SWR 7985; Spike in Steam Flows and Temperatures Dropping Quicker in Some Transient Tests; June 29, 2005  
 Closed SWR 8021; Determine if Tavg Effects during Test TR-6 Are Acceptable; July 14, 2005  
 List of Open Training Requests; November 1, 2006  
 List of Closed Training Work Requests for Last 12 Months; October 31, 2006  
 Training Performance Indicators - Simulator Manager Input; October 13, 2004 through May 24, 2006  
 Closed TR 04-718; Trainee Reaction TQ-AA-210-5103 for LORT Cycle 04-5; October 14, 2004  
 Closed TR 04-728; Trainee Reaction TQ-AA-210-5103; June 3, 2005  
 Closed TR 04-723; Trainee Reaction TQ-AA-210-5103 for LORT Cycle 04-5; September 17, 2004  
 Closed TR 04-718; Trainee Reaction TQ-AA-210-5103 04-7 Crew C; April 28, 2005  
 Closed TR 05-463; Student Provided Feedback; January 11, 2006  
 LORT Cycle Curriculum Review Committee Meeting Minutes; dated various from October 13, 2004 through May 24, 2006  
 Requalification Examinations (Operating); dated various 2006  
 Requalification Examinations (Written); dated various 2006

#### Corrective Action Documents as a Result of NRC Inspection

IR 551556; Training: Simulator Work Request Issue; October 31, 2006 (NRC Identified)  
 IR 558176; Segregation of Students, Training Improvement Opportunity, November 3, 2006 (NRC Identified)  
 IR 558180; Low Quality Package, Training Improvement Opportunity, November 3, 2006 (NRC Identified)  
 IR was Initiated Based on NRC Observations During Inspection (NRC Identified)

#### 1R12 Maintenance Effectiveness

(A)(1) Action Plan for VV1, July 13, 2005  
 Material Condition Improvement Plan; MSIV/Safety Valve Enclosure Ventilation Modification, August 03, 2005  
 IR 264685; Found 1VV01CD Running With No Discharge or Recirculation Path, October 18, 2004  
 IR 318059; Temperature Controller (Thermostat) Has Failed, March 28, 2005  
 IR 318063; Temperature Controller (Thermostat) Failed for 1D MSIV Room, March 28, 2005  
 IR 344768; 2A MSIV Vent Fan Discharge Damper is Closed, June 16, 2005  
 IR 553349; 1A DG Cooldown Cycle Failure Causes Delay in SAT Outage, November 04, 2006  
 IR 556907; Question Whether the 1A DG is Operable, November 12, 2006  
 Apparent Cause Report; 1A DG Slowed to Idle Speed Due to Relay Failure, December 13, 2006  
 BYR-28090; Failure Analysis (1) Kilovac Relay PD10AC57, November 22, 2006

### 1R13 Maintenance Risk Assessment and Emergent Work Control

Unit 2 Risk Configurations, Week of October 02, 2006, Revision 1

Protected Equipment Log, October 5, 2006

IR 541127; Disabling TS Equipment to Prevent Valid Auto Start, October 6, 2006

WC-AA-101; Attachment 7 to Protected Equipment Process and Methodology, Revision 13

Unit 1 Risk Configurations, Week of November 06, 2006, Revision 2

Unit 1 Risk Configurations, Week of November 06, 2006, Revision 3

Unit 2 Risk Configurations, Week of November 06, 2006, Revision 2

Protected Equipment Log, November 06, 2006

Policy No. 400-47; Byron Operating Department Policy Statement, Revision 9

### Corrective Action Documents as a Result of NRC Inspection

IR 559537; Weaknesses in Byron's Protected Equipment Program, November 17, 2006  
(NRC Identified)

### 1R14 Personnel Performance During Non-Routine Evolutions

October 23, 2006 Byron Station Emergency Preparedness & Security Integrated Drill Evaluation Report, November 26, 2006

### 1R15 Operability Evaluations

IR 262818; Debris Discovered in 2B SX Pump Lube Oil Reservoir, October 12, 2004

IR 543978; Print Not Updated to Reflect a Change in Fire Seal Status, October 14, 2006

IR 559556; Lessons Learned From Offsite Fire Drill, November 17, 2006

IR 563447; 2SX01PB Found FME Thrust Bearing Disassembly, November 30, 2006

1A SX Pump Trend; November 27, 2006 - December 27, 2006

1B SX Pump Trend; November 12, 2006 - December 12, 2006

2A SX Pump Trend; November 12, 2006 - December 12, 2006

2B SX Pump Trend; November 27, 2006 - December 27, 2006

EC 378409; Evaluate Damaged Outboard Thrust Bearing Housing Damage During Pump Repair Work, Revision 0

ER-AA-2006; Lost Parts Evaluations, Revision 3

MA-AA-716-008; Attachment 10 - Loss of Integrity Notification and Recovery Plan, Revision 2

### Corrective Action Documents as a Result of NRC Inspection

IR 540438; NRC Question Concerning Fire Barrier on 383 Elevation, October 5, 2006  
(NRC Identified)

545892; NRC Issue Identified for 0LL077E; October 18, 2006 (NRC Identified)

IR 546853; Pre-Fire Plan/Fire Protection Plan/Plant Discrepancy, October 20, 2006  
(NRC Identified)

#### 1R19 Post Maintenance Testing

WO 736551-01; MM - Upgrade Seal Cooling Water Supply Piping, November 30, 2006  
WO 736551-03; OPS PMT - Visual, December 11, 2006  
WO 736551-10; OPS PMV - Verify Flood Seal Reinstalled, December 11, 2006  
WO 736551-11; OPS PMV - Verify Blind Flange Reinstalled, December 11, 2006  
WO 821150-01; IM Perform Calibration of 2FIS-0611  
WO 826580; stroke 1SI8811A with following valves aligned  
WO 826589; Replace AR Relay - Containment Sump ISO Valve Relay SI8811  
WO 832925-01; MM - Repair Outboard Bearing Oil Leak/Replace Oil Pump, December 01, 2006  
WO 832925-02; Remove/Reinstall Thermocouple From 0B Bearing Housing, November 30, 2006  
WO 832925-03; OP - PMT; No Oil Leakage and Pump Temperatures Are Normal, December 13, 2006  
WO 876174 09; OPS - PMT MOD Test Perform BOP VV-1 & Remove Temperature Vent, December 13, 2006  
WO 945382 01; Stroke Time Test for 2RH611, November 5, 2006  
WO 945714 02; OP Post Maintenance Test, Verify Proper RH Pump Motor Oil Level  
WO 947256 01; 2RH01PB Group A First Requirements for Residual Heat Removal Pump, November 7, 2006  
WO 947256 02; Instrument Maintenance Support 2BVSR 5.5.8.RH.5-2A 2B RH ASME Pump Run, November 7, 2007  
WO 965021; "MCR Fire Panel Fire Zones 1D-47/48 & 1S-36  
WO 966203; Troubleshoot Recirculating Dampers 1VD10YA & B  
IR 544073; VD System Temperature Controller Not Controlling 1A DG Room  
IR 569039; LO DP Alarm 1VV01CC, December 13, 2006  
MA-BY-EM-1-FP001-B-BY04; "Test Report Package Suppression Zone 1S-36, Detection Zone 1D-47/48 Fire Zone 3.3D, System Number 1EE4," dated 04/07/06  
MA-BY-EM-1-FP001; "Upper Cable Spreading Room Halon System Actuation Surveillance," Revision 9  
BAR 0-37-A4; Unit 1 Area Fire  
6E-1-4030FP04; Fire Detection Control Cabinet  
IR 569062; 1VV01CC Failed PMT for WO 876174, December 13, 2006

#### 1R20 Refueling and Outage Activities

Engineering Change 363000; Evaluation for Foreign Material Left in Unit 1 Containment  
IR 541200; Low Sensitivity to Foreign Material in Containment, October 2, 2006  
IR 544308; Not Getting the Message on Containment FME, October 15, 2006  
Evaluation of Boric Acid Leakage; Unit 1 In-Core Support/Reactor Vessel Outside Surfaces, Revision 3  
B1R14 Shutdown Risk Profile, October 1 - 13, 2006  
B1R14 Outage News, October 1 - 15, 2006

### Corrective Action Documents As A Result of NRC Inspection

IR 544108; NRC Question During Unit 1 Containment Walkdown in Mode 3, October 14, 2006 (NRC Identified)

IR 544092; Issues During Unit 1 Containment Walkdown in Mode 3, Many a Repeat of Previously Identified Cleanliness Issues on the Polar Crane, October 14, 2006 (NRC Identified)

### 1R22 Surveillance Testing

WO 935255 01; Unit 0 Deep Well Pump Make-up Flow Verification, December 27, 2006  
1BOSR 0.5-2.AF.1-1, Stroke Time Testing for Valves 1AF013 A through D

### 1R23 Temporary Plant Modifications

Engineering Change 363128; Provide RCS Loop 1B Hot Leg Indication to Remote  
Engineering Change 363442; Install Jumper at A1-A2 of Relay 43FSX in Panel 1PL07J to

Defeat Slow Start Capability of the 1A Diesel Generator, Revision 0  
Shutdown Panel Via Use of Spare Narrow Range RTDS, Revision 0

IR 556827; 1A DG Shifted to Slow After Being in Fast, 12 Hour Shutdown Clock, November 12, 2006

IR 556907; Question Whether the 1A DG is Operable, November 12, 2006

### Corrective Action Documents As A Result of NRC Inspection

IR 554339; 50.59 Screening Requires Revision, November 6, 2006 (NRC Identified)

### 2OS1 Access Control to Radiologically Significant Areas

RP-AA-460; Controls for High and Very High Radiation Areas; Revision 11

RP-AA-460-1001; Additional High Radiation Exposure Control; Revision 1

RP-AA-19; High Radiation Area Program Description; Revision 1

RP-AA-376; Radiological Postings, Labeling and Markings; Revision 1

RP-BY-500-1003; Radiological Controls for Handling Items and Hanging Activated Parts in the Spent Fuel Pool; Revision 1

### 1EP4 Emergency Action Level and Emergency Plan Changes

Byron Station Annex of the Exelon Standardized Emergency Plan; Revision 17

### 1EP6 Drill Evaluation

Nuclear Accident Reporting System (ARs) Form, October 23, 2006

EP-AA-112-F-01; Command and Control Turnover Briefing Form, Revision B

Byron EP/Security Integrated PI Drill, October 23, 2006

LS-AA-1150; Reactor Plant Event Notification Worksheet, Revision 0

#### 40A2 Identification and Resolution of Problems

IR 350579; 1B DG Air Manifold Temperature Swinging, July 06, 2005  
IR 374363; SOS to Perform Aggregate Assessment of Operator Work Arounds, November 30, 2006  
IR 438719; Temperature Swings During 1B DG Run, January 04, 2006  
IR 544667; Work Inside Missile Barrier During Mode Change, October 15, 2006  
IR 567449; Procedure Change Needed for Units 1 & 2 BOSR DG-2/3, December 08, 2006  
WO 901581, OWA Coordinator to Review Degraded Equipment List, Temporary Modification Log, Out of Service Log, etc , June 10, 2006  
WO 929912, OWA Coordinator to Review Degraded Equipment List, Temporary Modification Log, Out of Service Log, etc , September 4, 2006  
OP-AA-102-103, "Operator Work-Around Program," Revision 1  
Standing Order 06-059, ½ BOA Elec-3 Procedure Weakness in Resetting DG Overspeed Trip, dated November 13, 2006  
Standing Order 06-060, Recent Observations of Operating Responsible Areas Identified 2 Deficiencies-housekeeping and log keeping, dated November 12, 2006  
Listing of all 2006 IRs by Significance level  
Listing of all 2006 Apparent Cause Evaluations  
Listing of all 2006 Common Cause Assessments  
Listing of all 2006 Quick Human Performance Investigations  
Listing of all 2006 IRs Coded Level 3 and Above that were Human Performance or Technical Human Performance  
Common Cause Analysis 551404-12; Engineering Corrective Action Program Quarterly Trending Identified Human Error Prevention Issues, December 14, 2006  
Engineering Change 352661; Non-Safety Related Pump Trico Oiler Relocation  
MA-AA-734-400; Constant Level Oiler and Sight-Glass Maintenance, Revision 0  
BAP 370-1; Station Lubrication Program, Revision 9

#### Corrective Action Documents as a Result of NRC Inspection

IR 441546; Question Regarding Necessity to BOP DG-11T2 Procedure Revision, January 04, 2006 (NRC Identified)  
IR 559496; Oiler Piping Needs to Reflect OEM Drawing, November 17, 2006 (NRC Identified)  
IR 559601; Discrepancies with Oiler Piping Installation, November 17, 2006 (NRC Identified)  
IR 559604; Discrepancies with Oiler Piping and Oiler Bowl Size, November 17, 2006 (NRC Identified)  
IR 569751; Evaluate 1B AF Pump Gearbox Oil PP for Operator Challenge, December 15, 2006 (NRC Identified)

#### 40A3 Event Follow-up

LER 454/2006-003; Inadvertent Exceeding of TS Action Requirement Completion Time for Containment Spray Additive System Due to Not Recognizing an Inoperable Condition, September 01, 2006



#### 4OA5 Other Activities

BB PRA-017.27B; Byron Reactor Oversight Program MSPI Basis Document; Revision 2;  
BISR 3.4.2-200; Surveillance Calibration of Auxiliary Feedwater to Steam Generators A, B, C and D Flow Control Loops, Revision  
1BOSR 5.2.2-1; Unit 1 ECCS Venting and Valve Alignment Monthly Surveillance, Revision 23  
1BOSR 0.5-2.AF.1-2; 1AF013E/F/G/H Stroke Test on Unit 1, Revision 4  
1BOSR 0.5-2.CV.1-1; Chemical and Volume Control System "A" Train Miniflow Valve Stroke Test on Unit 1, Revision 6  
1BOSR 0.5-2.RH.3-3; 1RH610 Position Indication Test for Unit 1, Revision 5  
1BOSR 3.2.3-1; Unit 1 Undervoltage Simulated Start of 1A Auxiliary Feedwater Pump Monthly Surveillance, Revision 2  
2BOSR 5.2.2-1; Unit 2 ECCS Venting and Valve Alignment Monthly Surveillance, Revision 17  
2BOSR 0.5-2.RH.2-2; Unit 2 train B Residual Heat Removal System Valve Stroke and Position Indication Test, Revision 7  
2BOSR 0.5-2.SI.2-2.2; 2SI18802B, 2SI8809B, 2SI8811B and 2SI8923B Stroke Test and Position Indication Test, Revision 7  
2BOSR 0.5-3.CC.1-3.1; 2CC9412A Stroke Test for Unit 2  
2BOSR 3.2.8-620A; Unit 2 ESFAS Instrumentation Slave Relay Surveillance (Train A Auxiliary Feedwater Actuation - Relay K633, K62-0), Revision 0  
1BVSR 5.5.8.CC.5-2c; Unit 1 Comprehensive Inservice Testing (IST) Surveillance Requirements for Component Cooling Pump 1CC01PB, Revision 0  
2BVSR 5.5.8.RH.5-1a; Unit 2 Group A Inservice Testing (IST) Requirements for Residual Heat Removal Pump 2RH01PA, Revision 0  
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#### Corrective Action Documents As A Result of NRC Inspection

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IR 572142; MSPI Baseline Unavailability Period Incorrect, December 21, 2006 (NRC Identified)  
IR 572244; MSPI Baseline Unavailability Data Discrepancies HPI & RHR, December 21, 2006  
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IR 572303; MSPI Data Question for Diesel Generator Reporting, December 21, 2006  
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IR 572582; Documentation of NRC Questions on MSPI-SX System, December 22, 2006  
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IR 579340; Display Anomaly in Outdated Maintenance Rule Database, January 16, 2007  
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## LIST OF ACRONYMS USED

AC	Alternating Current
ADAMS	Agencywide Documents Access and Management System
AFW	Auxiliary Feedwater
ALARA	As Low As Reasonably Dose Equivalent
ANS	Alert and Notification System
ANSI	American National Standard Institute/American Nuclear Society
ASME	American Society of Mechanical Engineers
BACC	Boric Acid Corrosion Control
CAP	Corrective Action Program
CFR	Code of Federal Regulations
DG	Diesel Generator
DRP	Division of Reactor Projects; Region RIII
IEMA	Illinois Emergency Management Agency
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Issue Report
ISI	Inservice Inspection
JPM	Job Performance Measure
LER	Licensee Event Report
LOOP	Loss Of Offsite Power
LORT	Licensed Operator Requalification Training
MSPI	Mitigating System Performance Index
NCV	Non-Cited Violation
NDE	Nondestructive Examination
NRC	United States Nuclear Regulatory Commission
PARS	Public Availability Records
PI	Performance Indicator
RCA	Radiologically Controlled Area
RCS	Reactor Coolant System
RI	Resident Inspector
RO	Reactor Operator
SAT	Systems Approach to Training
SDP	Significance Determination Process
SRO	Senior Reactor Operator
SSC	Structures, Systems, & Components
SWR	Simulator Work Request
SX	Essential Service Water
TR	Training Request
TRM	Technical Requirement Manual
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
WO	Work Order
WR	Work Request