

January 29, 2003

Mr. John L. Skolds, President  
Exelon Nuclear  
Exelon Generation Company, LLC  
4300 Winfield Road  
Warrenville, IL 60555

SUBJECT: BYRON STATION, UNITS 1 AND 2  
NRC INTEGRATED INSPECTION REPORT 50-454/02-07; 50-455/02-07

Dear Mr. Skolds:

On December 28, 2002, the United States 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 7, 2003, with Mr. S. Kuczynski and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and to 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.

Two findings of very low safety significance (Green) were either self-revealed or identified by the NRC as documented in the report. In addition, one violation of very low safety significance was identified by your staff, and is listed in Section 4OA7 of the report.

If you contest the subject or severity of the Non-Cited Violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U. S. Nuclear Regulatory Commission - Region III, 801 Warrenville Road, Lisle, IL 60532-4351; the Director, Office of Enforcement, U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector office at the Byron facility.

Since the terrorist attacks on September 11, 2001, the NRC has issued two Orders (dated February 25, 2002, and January 7, 2003) and several threat advisories to licensees of commercial nuclear power reactors to strengthen licensee capabilities, improve security force readiness, and enhance access authorization. The NRC also issued Temporary Instruction 2515/148 on August 28, 2002, that provided guidance to inspectors to audit and inspect licensee implementation of the interim compensatory measures (ICMs) required by the February 25<sup>th</sup> Order. Phase 1 of TI 2515/148 was completed at all commercial nuclear power reactors in 2002, and the remaining inspections are scheduled for completion in 2003. Additionally, table-top security drills were conducted at several licensees to evaluate the impact of expanded adversary characteristics and the ICMs on licensee protection and mitigative strategies. Information gained and discrepancies identified during the audits and drills were

J. Skolds

reviewed and dispositioned by the Office of Nuclear Security and Incident Response. During 2003, the NRC will continue to monitor overall safeguards and security controls, conduct inspections, and resume force-on-force exercises at selected nuclear power plants. Should threat conditions change, the NRC may issue additional Orders, advisories, and temporary instructions to ensure adequate safety is being maintained at all commercial nuclear power reactors.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

*/RA/*

Ann Marie Stone, Chief  
Branch 3  
Division of Reactor Projects

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

Enclosure: Inspection Report 50-454/02-07;  
50-455/02-07  
Attachment: Supplemental Information

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

REGION III

Docket Nos: 50-454; 50-455

License Nos: NPF-37; NPF-66

Report Nos: 50-454/02-07; 50-455/02-07

Licensee: Exelon Generation Company, LLC

Facility: Byron Station, Units 1 and 2

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

Dates: October 1 through December 28, 2002

Inspectors: R. Skokowski, Senior Resident Inspector  
P. Snyder, Resident Inspector  
M. Bielby, Reactor Inspector  
J. Maynen, Physical Security Inspector  
D. Schrum, Reactor Inspector  
S. Sheldon, Reactor Inspector  
T. Tongue, Project Engineer  
R. Winter, Reactor Inspector  
C. Thompson, Illinois Department of Nuclear Safety

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

Enclosure

## SUMMARY OF FINDINGS

IR 05000454-02-07, 05000455-02-07; Exelon Generation Company, LLC; on 10/01-12/28/02, Byron Station; Units 1 & 2. Operability Evaluations, Refueling and Outage Activities and Identification and Resolution of Problems.

This report covers a 3-month period of baseline resident inspection and announced baseline inspections on licensed operator requalification training and maintenance effectiveness. In addition a physical security pre-inspection audit for interim compensatory measures was completed. The inspection was conducted by Region III inspectors and the resident inspectors. Two Green findings were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be "green" or be assigned a severity level after United States Nuclear Regulatory Commission (NRC) management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

### A. Inspection Findings

#### **Cornerstone: Initiating Events**

- Green. A finding of very low significance was identified through a self-revealing event. Inadequate installation instructions led to an improperly installed turbine coupling windage shield cover on the Unit 2A low pressure turbine. This resulted in a windage shield cover failing and coming off of the coupling causing vibrations over the trip value. This resulted in a manual turbine trip and reactor shutdown.

This finding was more than minor because it increased the likelihood of a reactor trip event due to a turbine trip. This finding was of very low safety significance because the finding did not contribute to a loss of coolant accident, did not affect mitigating equipment functions and did not increase the likelihood of a fire or external event. This finding impacted the Initiating Event Cornerstone for Unit 2. No violations of NRC requirements occurred. (Section 1R20.1)

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

- Green. The inspectors identified a finding of very low safety significance regarding the licensee's failure to adequately evaluate the operability of the 2B essential service water pump following the identification of a 30 drop per minute lube oil leak. The primary cause of this finding was related to the cross-cutting area of human performance. Despite the fact that the 2B essential service water pump was degraded due to a 30 drop per minute lube oil leak, the licensee declared the pump operable without sufficient justification.

This finding was more than minor because it involved an inadequate operability evaluation of the essential service water, which was associated with a human

performance attribute of the Mitigating Systems cornerstone. This finding of very low safety significance because it did not represent an actual loss of function of the essential service water system nor did it involve a potential risk significance due to external events. No violations of NRC requirements occurred.  
(Section 1R15)

**B. Licensee Identified Violations**

A violation of very low safety significance, which was identified by the licensee, has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and corrective action tracking number is listed in Section 4OA7 of this report.

## Report Details

### Summary of Plant Status

Unit 1 operated at or near full power throughout the inspection period except for two plant trips. The first trip occurred on October 15, 2002 and was caused by a fault in the turbine control system. After troubleshooting and replacing cards, the unit was restarted on October 16, 2002 and reached full power on October 18, 2002. On November 7, 2002, the unit again tripped due to a fault in the turbine control system. The licensee determined that a failure of a bit logic circuit board in the digital electro-hydraulic control system failed and was the cause of both trips. Following repair, the unit was restarted on November 8, 2002 and reached full power on November 9, 2002. The unit remained at or near full power for the remainder of the report period.

Unit 2 began the inspection period shut down for a refueling outage. On October 7, 2002, restart activities began with the unit reaching full power on October 9, 2002. The unit operated at or near full power until the unit was ramped down to about 20 percent power for repairs to a feed water regulating valve on October 13, 2002. The unit returned to full power following repairs on October 14, 2002 and remained at or near full power for the remainder of the report period.

## **1. REACTOR SAFETY**

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

#### 1R01 Adverse Weather (71111.01)

##### a. Inspection Scope

The inspectors evaluated the licensee's preparation for adverse weather conditions during the winter months (i.e., below freezing temperatures and accumulation of ice and snow), which could potentially lead to a loss of offsite power or a loss of mitigating systems. The inspectors walked down the river screen house, primary water storage tanks, reactor water storage tanks, condensate storage tanks, and other areas of the station potentially affected by cold weather to inspect insulated and trace heated piping and components, operation of area space heaters, and closure of outside air dampers. The inspectors selected the river screen house and the storage tanks listed because they were either identified as risk significant in the licensee's risk analysis or had experienced problems with freezing and/or leaf accumulation in the past year. The inspectors interviewed operations department personnel and reviewed applicable portions of the Updated Final Safety Analysis Report (UFSAR). The documents listed in the Attachment to this report were also used by the inspectors to evaluate this area.

In addition, the inspectors reviewed the issues that the licensee entered into its corrective action program to verify that identified problems were being entered into the program with the appropriate characterization and significance. The inspectors also reviewed the licensee's corrective actions for cold weather related issues documented in selected condition reports (CrS).



b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

.1 Partial Walkdowns

a. Inspection Scope

The inspectors performed partial walkdowns of accessible portions of trains of risk-significant 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 checklists listed in the Attachment to this report and applicable system drawings to verify that selected components were properly positioned and that support systems were lined up as needed. The inspectors selected the system components based on risk significance and operators' use during the implementation of emergency operating procedures. In addition to verifying proper alignment, the inspectors also examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors used the information in the appropriate sections of the UFSAR to determine the functional requirements of the systems.

The inspectors verified the alignment of the following:

- Unit 0 and Unit 2 Station Air and Instrument Air on November 6 through 8, 2002;
- Unit 2 Circulating Water Pumps on November 13, 2002;
- Unit 1 Auxiliary Feedwater System train A on December 5, 2002; and
- Unit 2 Feedwater System on December 7, 2002.

The inspectors reviewed selected CRs concerning improper equipment alignments to determine if the licensee had properly identified and resolved these issues. The inspectors reviewed the extent of condition, corrective actions taken and corrective action timeliness of the issues described in the selected CRs. The documents reviewed during this inspection are listed at the end of the report.

b. Findings

No findings of significance were identified.

.2 Complete Walkdown

a. Inspection Scope

On November 5, 2002, the inspectors performed a complete system alignment inspection of the Unit 2 train A essential service water (SX) system. This system was selected because it was considered both safety related and risk significant in the licensee's probabilistic risk assessment. The inspection consisted of the following activities:

- a review of plant procedures (including selected abnormal and emergency procedures), drawings, and the UFSAR to identify proper system alignment;
- a review of operator work arounds to determine applicability to the essential service water system;
- a review of outstanding work requests on the system;
- a review of the essential service water system health evaluation; and
- an electrical and mechanical walkdown of the system to verify proper alignment, component accessibility, availability, and current condition.

The inspectors also reviewed selected issues documented in CRs, to determine if they had been properly addressed in the licensee's corrective actions 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)

a. Inspection Scope

The inspectors conducted visual inspections of six plant fire zones. The inspectors reviewed applicable portions of the Byron Station Fire Protection Report and selected the fire zones for inspection based on their overall contribution to internal fire risk, as documented in the Individual Plant Examination of External Events Report. During the inspections, 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 inspectors examined the plant areas listed below to observe conditions related to fire protection:

- Auxiliary Building Elevation 401' - 0" (Zone 14.2-0) on October 9, 2002;
- Auxiliary Building Elevation 401' - 0" (Zone 11.5-0) on October 9 through 28, 2002;
- Unit 1 Auxiliary Electrical Equipment Room (Zone 5.5-1) on October 23, 2002;
- Auxiliary Building Elevation 401' - 0" (Zone 14.3-0) on October 28, 2002;
- Unit 2 Auxiliary Electrical Equipment Room (Zone 5.5-2) on November 25, 2002; and
- Turbine Building Elevation 451'-0" (Zone 8.6-0) on December 12, 2002.

The inspectors also reviewed selected issues documented in CRs, to determine if they had been properly addressed in the licensee's corrective actions program. The 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)

a. Inspection Scope

The inspectors evaluated whether the licensee took appropriate precautions to mitigate the risk from external and internal flooding events. Specifically, the inspectors performed the following:

- Reviewed the UFSAR and other selected design basis documents to identify those areas susceptible to flooding;
- Performed a walkdown of the river screen house, essential service water pump rooms and the areas above, as well as the external areas around the auxiliary and containment buildings, to evaluate whether appropriate flood protection controls were being maintained;
- Reviewed selected surveillance tests and maintenance records for watertight doors, flood seal openings and selected instrumentation (such as sump alarms) that help identify flooding events;
- Reviewed selected station operating procedures used to identify and mitigate flooding events; and
- Interviewed selected operating, maintenance and engineering staff regarding flood protection controls.

The river screen house, essential service water pump rooms, and areas above, as well as exterior areas of the auxiliary building and containment buildings were selected for the plant walkdown based on their susceptibility to flooding events as described in the licensee's design basis documents. The walkdown consisted primarily of observing equipment below the postulated floodline, floor and wall penetrations, flood seal openings watertight doors, room drains and sumps, and exterior guide and drainage capabilities.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11)

.1 Quarterly Resident Review

a. Inspection Scope

On November 12, 2002, the inspectors observed an operating crew during an "out-of-the-box" requalification examination on the simulator using Scenario "Cycle 02-06 00B," Revision 0. The inspectors evaluated crew performance in the areas of:

- clarity and formality of communications;
- ability to take timely actions in the safe direction;
- prioritization, interpretation and verification of alarms;

- procedure use;
- control board manipulations;
- supervisor's command and control;
- management oversight; and
- group dynamics.

Crew performance in these areas was compared to licensee management expectations and guidelines as presented in the following documents:

- OP-AA-101-111, "Rules and Responsibilities of On-Shift Personnel," Revision 0;
- OP-AA-103-102, "Watchstanding Practices," Revision 0;
- OP-AA-103-103, "Operation of Plant Equipment," Revision 0;
- OP-AA-103-104, "Reactivity Management Control," Revision 0; and
- OP-AA-104-101, "Communications," Revision 0.

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 evaluators to verify that they also noted the issues and discussed them in the critique at the end of the session.

b. Findings

No findings of significance were identified.

.2 Facility Operating History

a. Inspection Scope

The inspectors reviewed the plant's operating history from September 2001, through October 2002, to assess whether the Licensed Operator Requalification Training (LORT) program had addressed operator performance deficiencies noted at the plant.

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 program. The inspectors reviewed the current year annual requalification operating test and the previously administered biennial written examination material to evaluate general quality, construction, and difficulty level. The operating test material consisted of dynamic simulator scenarios and job performance measures (JPMs). The biennial written examination material consisted of a combined "Plant and Control Systems," Section A, static simulator and "Administrative Controls/Procedural Limits," Section B, made up of multiple-choice question format. 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 inspectors assessed the level of examination material duplication during the current year annual examination (through three examinations). The inspectors also interviewed members of the licensee's management and training staff, and discussed various aspects of the examination development.

b. Findings

No findings of significance were identified.

.4 Licensee Administration of Requalification Examinations

a. Inspection Scope

During the week of October 15, 2002, the inspectors observed the administration of the requalification operating test to assess the licensee's effectiveness in conducting the test and to assess the facility evaluators' ability to determine adequate performance using objective, measurable performance standards. The inspectors evaluated, in parallel with the facility evaluators, the performance of 12 licensed operators for one operating shift crew during two dynamic simulator scenarios. The operating shift crew was divided into two simulator crews for evaluation purposes. Each simulator crew consisted of three Senior Reactor Operators and three Reactor Operators. The inspectors conducted reviews to verify that all licensed operators participated in at least two evaluated scenarios during the annual test and at some time during the annual training cycle as required by the facility licensee's training program. In addition, the inspectors observed licensee evaluators administer five JPMs to a select number of operators. The inspectors observed the training staff personnel administering the operating test, including pre-examination briefings, observations of operator performance, individual and crew evaluations after dynamic scenarios, techniques for JPM cuing, and the final evaluation briefing for licensed operators. The inspectors evaluated the performance of the simulator to determine its ability to adequately support the examinations. The inspectors also reviewed the licensee's overall examination security program.

b. Findings

No findings of significance were identified.

.5 Licensee Requalification Training Feedback Process

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 interviewed licensee personnel (operators, instructors, and management) and reviewed the applicable licensee's procedures. In addition, the inspectors reviewed the licensee's quality assurance/quality control oversight activities, including the licensee's training and

department self-assessment reports, to evaluate its ability to assess the effectiveness of its LORT program and to implement appropriate corrective actions.

b. Findings

No findings of significance were identified.

.6 Licensee Remedial Training Program

a. Inspection Scope

The inspectors observed training staff personnel evaluate and administer a remediation scenario to one simulator operating crew and two individuals that had demonstrated unsatisfactory performance during an annual operating test scenario administered the previous week. The inspectors assessed the adequacy and effectiveness of the remedial training to ensure that it 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, and interviewed licensee personnel (operators, instructors, and training management). In addition, the inspectors reviewed the licensee's current examination cycle remediation packages for unsatisfactory operator performance on the operating tests to ensure that remediation and subsequent re-evaluations were completed prior to returning individuals to licensed duties.

b. Findings

No findings of significance were identified.

.7 Conformance with Operator License Condition

a. Inspection Scope

The inspectors evaluated the facility and individual operator licensees' conformance with the requirements of 10 Code of Federal Regulations (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 procedural compliance and the process for tracking on-shift hours for licensed operators and which control room positions were granted credit for maintaining active operator licenses. The inspectors also reviewed nine licensed operators' medical records maintained by the facility's medical staff for ensuring the medical fitness of licensed operators and to assess compliance with medical standards delineated in American National Standards Institute (ANSI)/ANS-3.4 and with 10 CFR 55.21 and 55.25. In addition, the inspectors reviewed the licensee's LORT program to assess compliance with the requalification program requirements as described by 10 CFR 55.59(c).

b. Findings

No findings of significance were identified.

.8 Written Examination and Operating Test Results

a. Inspection Scope

The inspectors reviewed the pass/fail results of the previous (2001) annual written examinations and the current (2002) annual operating tests (required to be given per 10 CFR 55.59(a)(2)) administered by the licensee.

b. Findings

No findings of significance were identified.

.9 Conformance with Simulator Requirements

a. Inspection Scope

The inspectors evaluated the conformance of the licensee's simulation facility for use in administering the operating test and as a plant-referenced simulator for satisfying experience requirements for applicants for license applications as prescribed in 10 CFR 55.46. The inspectors reviewed the facility licensee's process for continued assurance of simulator fidelity with regard to identifying, reporting, correcting, and resolving simulator discrepancies. The inspectors reviewed simulator certification testing to assess compliance with standards delineated in ANSI/ANS-3.5 and with 10 CFR 55.46(c) and 55.46(d).

b. Findings

No findings of significance were identified.

.10 Overall Annual Operating Test Results

a. Inspection Scope

The inspectors reviewed the overall Licensed Operator Annual Requalification Examination pass/fail results of the individual JPM and simulator operating tests (required to be given per 10 CFR 55.59(a)(2)) administered by the licensee during calendar year 2002. The biennial written examination was administered during calendar year 2001. The inspectors also reviewed applicability of the operating tests to the United States Nuclear Regulatory Commission (NRC) Inspection Manual Chapter (IMC) 0609, Appendix I, "Operator Requalification Human Performance SDP."

b. Findings

No findings of significance were identified.

## 1R12 Maintenance Effectiveness (71111.12)

### .1 Routine Evolutions

#### a. Inspection Scope

The inspectors evaluated the licensee's implementation of the maintenance rule, 10 CFR 50.65, as it pertained to identified performance problems with the following equipment and systems:

- VA-4 "Auxiliary Building Ventilation and Essential Service Water Portions of Equipment Cubicle Coolers for the Charging and Residual Heat Removal Pumps."

During this inspection, the inspectors evaluated the licensee's monitoring and trending of performance data, verified that performance criteria were established commensurate with safety, and verified that equipment failures were appropriately evaluated in accordance with the maintenance rule. These aspects were evaluated using the licensee's maintenance rule scoping and report documents. For each system, structure, and component (SSC) reviewed, the inspectors also reviewed the significant work orders and CRs listed in the Attachment to this report to verify that failures were properly identified, classified, and corrected, and that unavailable time had been properly calculated. The inspectors also interviewed system engineers, operations department personnel and the station's maintenance rule coordinator.

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

#### b. Findings

No findings of significance were identified.

### .2 Periodic Evaluation

#### a. Inspection Scope

The objective of the inspection was to:

- verify that the periodic evaluation was completed within the time restraints defined in 10 CFR 50.65, the maintenance rule (once per refueling cycle, not to exceed 2 years), ensuring that the licensee reviewed its goals, monitoring, preventive maintenance activities, industry operating experience, and made appropriate adjustments as a result of that review;
- verify that the licensee balanced reliability and unavailability during the previous refueling cycle, including a review of safety significant SSCs;
- verify that (a)(1) goals were met, corrective actions were appropriate to correct the defective condition including the use of industry operating experience, and (a)(1) activities and related goals were adjusted as needed; and



- verify that the licensee has established (a)(2) performance criteria, examined any SSCs that failed to meet their performance criteria, or reviewed any SSCs that have suffered repeated maintenance preventable functional failures including a verification that failed SSCs were considered for (a)(1).

The inspectors examined the last two periodic evaluation reports for the time frames January 1999 through June 2000, and July 2000 through December 2001. To evaluate the effectiveness of (a)(1) and (a)(2) activities, the inspectors examined (a)(1) action plans, justifications for returning SSCs from (a)(1) to (a)(2), and a number of CRs. In addition, the CRs were reviewed to verify that the threshold for identification of problems was at an appropriate level and the associated corrective actions were appropriate. The inspectors focused the inspection on the following systems:

- auxiliary feedwater;
- emergency diesel generator;
- essential service water; and
- circulating water.

In addition, the inspectors reviewed three self-assessments that addressed maintenance rule implementation at Byron. 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 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, observed operator turnover, observed plan-of-the-day meetings, and reviewed the documents listed in the Attachment to this report to verify 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 verified that the licensee controlled emergent work in accordance with Nuclear Station Procedure WC-AA-101, "On-Line Work Control Process," Revision 6.

The inspectors reviewed the following activities:

- simultaneous planned outages of the Unit 1 station air compressor and Unit 2 steam generator “C” power operated relief valve on November 4, 2002;
- emergent work due to a leak on the Unit 1 train B Essential service water pump seal cooling water line, November 4, 2002;
- simultaneous planned outages of the Unit 1 station air compressor and Unit 2 train B essential service water pump;
- emergent work due to failure of Unit 2 train B charging pump on November 12 & 13, 2002;
- simultaneous outages of the Unit 2 train A feedwater pump and train B auxiliary feedwater pump on December 5, 2002; and
- emergent work due to failure of the Unit 2 Battery charger 212 on December 14, 2002.

b. Findings

No findings of significance were identified.

1R14 Personnel Performance Related to Non-routine Plant Evolutions and Events (71111.14)

a. Inspection Scope

The inspectors observed control room operators during the following non-routine evolutions:

- Unit 2 reactor startup shut following refueling outage B2R10 on October 3, 2002;
- Unit 2 reactor startup and plant startup following the repair of the turbine windage shield on October 8, 2002;
- Unit 1 reactor trip following a turbine controls failure on October 15, 2002;
- Unit 1 reactor startup following forced outage B1F22 on October 18, 2002; and
- Unit 1 reactor trip following a turbine controls failure on November 7, 2002.

In each case the inspectors evaluated crew performance in the areas of:

- clarity and formality of communications;
- ability to take timely actions in the safe direction;
- prioritization, interpretation and verification of alarms;
- procedure use;
- control board manipulations;
- supervisor’s command and control;
- management oversight; and
- group dynamics.

Crew performance in these areas was compared to licensee management expectations and guidelines as presented in the following documents:

- OP-AA-101-111, “Rules and Responsibilities of On-Shift Personnel, “ Revision 0;
- OP-AA-103-102, “Watchstanding Practices,” Revision 0;
- OP-AA-103-103, “Operation of Plant Equipment,” Revision 0;
- OP-AA-103-104, “Reactivity Management Control,” Revision 0; and

- OP-AA-104-101, "Communications," Revision 0.

The inspectors also reviewed selected issues documented in CRs, to determine if they had been properly addressed in the licensee's corrective actions program. 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 CRs 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 reviewed the following operability evaluations:

- CR 122932, Unplanned Limiting Condition for Operation Action Requirement Entry for Fire Detection, September 14, 2002;
- CR 130103, 1B Essential Service Water Pump Has Leak from Cooling Line to Seal Housing, November 4, 2002;
- CR 130703, 2B Essential Service Water Pump Oil Leak - Failed Post Maintenance Testing, November 7, 2002;
- CR 133268, Loose Nut and 3/32 Lockwire on 1CC9463a, November 25, 2002; and
- CR 134118, Emergency Diesel Generator Speed Change While Adjusting Voltage, December 4, 2002.

The inspectors compared the operability and design criteria in the appropriate section of the Technical Specification (TS) and UFSAR to the licensee's evaluations to verify 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's Procedure LS-AA-105, "Operability Determination Process," Revision 0. 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 CRs, to determine if they had been properly addressed in the licensee's corrective actions program. The documents reviewed during this inspection are listed in the Attachment to this report.

## Findings

The inspectors identified a Green finding regarding the licensee's failure to have sufficient justification during their operability evaluation of the 2B essential service water (SX) pump that was degraded with a 30 drop per minute lube oil leak. This finding was not considered a violation of regulatory requirements.

## Description

On November 5, 2002 at 10:08 pm, the licensee began a work window on the 2B SX pump. On November 7, 2002, during the post maintenance test following the completion of a work window, the licensee identified a 30 drop per minute lube oil leak coming from the shaft driven oil pump. The licensee evaluated the leak and at 5:10 am on November 7, they declared the pump operable with the identified lube oil leak. On 10:15 a.m., the inspectors questioned the Shift Manager regarding the operability of the 2B SX pump, specifically with respect to the length of time the pump could run with the current oil leak. The inspectors asked if operator actions would be required to add oil to the pump to ensure pump operability. The inspectors also asked if any proposed actions were evaluated in accordance with NRC Generic Letter 91-18, "Information to Licensees Regarding NRC Inspection Section on Resolution of Degraded and Nonconforming Conditions," and Information Notice 97-78, "Crediting of Operator Actions in Place of Automatic Actions and Modification of Operator Actions, Including Response Times." Since the operability determination was made by the previous shift, the Shift Manager reviewed the existing limiting condition for operation action requirement paperwork and concluded that the operability decision was based on the system engineer's judgement and that no quantitative analysis was completed to determine how long the SX pump would run before oil would have to be added. As a result, the Shift Manager declared the 2B SX inoperable since the time that the work window began. In addition, an evaluation of the impact of the oil leak on pump operability, including the impact on the operators, was initiated. At 11:50 pm on November 7, 2002, repairs of the 2B SX pump oil leak were completed, the pump was successfully tested, and the Shift Manager declared the pump operable.

Subsequently the licensee complete engineering change 339734, "Evaluation of Past Operability of the 2B SX Pump with a 30 drop per minute Oil Leak," and concluded the operators had adequate procedural directions, training, qualifications and time necessary to replenish the 2B SX pump oil reservoir, had it become necessary, before the 2B SX would be adversely impacted; therefore, the pump was considered operable with the 30 drop per minute leak. In addition, the licensee's investigation also revealed a human performance problem associated with this event, in that, even though the 2B SX pump had a 30 drop per minute oil leak, the licensee declared the pump operable without sufficiently evaluating operability.

## Analysis

The inspectors determined that the failure to adequately evaluate the operability of the 2B SX pump, which was degraded due to the 30 drop per minute oil leak, was an operator performance deficiency warranting a significance evaluation in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Disposition

Screening,” issued on April 29, 2002. The inspectors determined that the finding was more than minor because it involved inadequate evaluation of the SX pump operability and therefore, the human performance attribute of the Mitigating Systems cornerstone. The inspectors determined that the inadequate operability determination also affected the cross-cutting area of Human Performance, in that, the licensee declared the degraded 2B SX pump operable without sufficient justification.

The inspectors determined that the finding could be evaluated using the SDP in accordance with IMC 0609, “Significance Determination Process,” because the finding was associated with a degraded SX train and its operability and reliability as discussed above. For the Phase 1 screening, the inspectors answered “no” to all five questions in the Mitigating System Cornerstone column because it did not represent an actual loss of function nor did it involve a potentially risk significant due to external events. Therefore, the finding was of very low safety significance (Green) (FIN 50-455/02-07-01).

### Enforcement

The inspectors determined that since 2B SX pump was only degraded but operable and that the licensee completed the repairs to the 2B SX pump prior to exceeding the applicable TS limiting condition for operation allowed outage time, no violation of regulatory requirements occurred. The licensee entered the event into its corrective action system as CR 00130664, “Operability of 2B SX Pump,” dated November 7, 2002.

## 1R16 Operator Work-Arounds (71111.16)

### Inspection Scope

The inspectors reviewed the following operator challenge:

- Operator Challenge 280, Unit 2 steam generator leak tracker program.

In addition, the inspectors performed the semiannual review of the cumulative effects of operator work-arounds (OWA). During this review the inspectors considered the cumulative effects of OWA on the following:

- The reliability, availability, and potential for mis-operation of a system;
- The ability of operators to respond to plant transients or accidents in a correct and timely manner; and
- The potential to increase an initiating event frequency or affect multiple mitigating systems.

The inspectors interviewed operating, chemistry and engineering department personnel and reviewed selected procedures and the documents listed in the Attachment to this report. In addition, the inspectors monitored the licensee’s OWA meeting conducted on December 12, 2002, for appropriate attendance, discussion, classification and/or reclassification of OWAs and operator challenges.

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

#### 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 verify 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 observed portions of the post maintenance tests, interviewed maintenance, operations and engineering department personnel and reviewed the completed post maintenance testing documentation. The inspectors used the appropriate sections of the TS and UFSAR, as well as the documents listed in the Attachment to this report, to evaluate this area.

Testing subsequent to the following activities was observed and evaluated:

- Unit 2 Main Turbine Following Emergent Repairs on October 7, 2002;
- Unit 0 train B Essential Service Water Makeup Pump on October 9, 2002;
- Unit 2 train B Charging Pump Following Replacement of the Rotating Element on November 16 and 17, 2002;
- Unit 0 train A Essential Service Water Makeup Pump Following Service Water Leak Repair and Replacement of the Air Box Trip Relay on November 21, 2002;
- Unit 2 train B Component Cooling Pump Discharge Check Valve (2CC9463A) on November 22, 2002;
- Unit 2 train B Auxiliary Feedwater Pump Shutdown Solenoid Valve Replacement on December 5, 2002; and
- Unit 1 train B Auxiliary Feedwater Pump Shutdown Solenoid Valve Replacement on December 6, 2002.

The inspectors also reviewed selected issues documented in CRs, to determine if they had been properly addressed in the licensee's corrective actions program.

##### b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities (71111.20)

.1 Refueling Outages

a. Inspection Scope

When this inspection period began, most activities associated with the B2R10 refueling outage had already been completed. Other activities and findings associated with this outage were documented in Inspection Report 50-454/02-06; 50-455/02-06.

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. The inspectors monitored startup activities of the B2R10 refueling outage to ensure that:

- correct system lineups were maintained for key mitigating systems;
- technical specifications and license conditions were met; and
- reactor coolant system boundary leakage barriers were properly established.

The inspectors interviewed operations, engineering, and work control personnel and reviewed selected procedures and documents.

The inspectors verified that the licensee was identifying problems at the appropriate threshold and entering them into their corrective actions program. The inspectors also reviewed selected issues documented in CRs, to determine if they had been properly addressed in the licensee's corrective actions program. The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

A Green finding was self-revealed regarding an inadequate installation instruction that led to an improperly installed turbine coupling windage shield cover on the Unit 2 A low pressure turbine. This resulted in the windage shield cover at coupling number four failing and coming off of the coupling causing vibrations over the trip value resulting in a manual turbine trip and a reactor shutdown. No violation of NRC requirements occurred.

Description

On October 2, 2002, at about 9:05 pm, during turbine overspeed trip testing at approximately 1875 rpm, the governor side turbine coupling windage shield cover on the Unit 2 A low pressure turbine number four coupling came loose. It then contacted a stationary object causing it to completely separate from its associated coupling. An operator in the area concurrently heard an audible bang.

Operators in the main control room noticed increased turbine vibrations above the trip values. Several vibration alarms were received but this was expected during this evolution. The turbine tripped on mechanical overspeed at 1917 rpm as indicated by the control system. The turbine was re-latched per procedure and speed increased again

from a low rotational speed of more than 1450 rpm. A control room operator then manually tripped the turbine due to continued elevated vibration levels.

The operators took appropriate actions by entering abnormal operating procedures 2BOA TG-8 entitled "Turbine Trip Below P-8" and 2BOA TG-1 entitled "Turbine High Vibration, Eccentricity, of Differential Expansion." The operators shut down the Unit 2 reactor and the licensee initiated troubleshooting and repair activities.

A prompt investigation revealed that the probable cause of the event was an improperly installed turbine windage shield cover on the number four bearing inside the Unit 2 A low pressure turbine housing. The root cause report identified that shear failure of the bolts holding the number four turbine coupling windage shield cover allowed the cover to come off of its installed location. The report stated that the bolts failed because the cover did not stay within the machined edge of the coupling flange face. The licensee concluded that critical parameters for installation of the cover were not identified nor placed in written work instructions.

### Analysis

The inspectors determined that the failure to place critical parameters in written work instructions for the installation of the turbine coupling windage shield covers was a performance deficiency warranting a significance evaluation in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B "Issue Disposition Screening" issued on April 29, 2002. The inspectors determined that this finding is more than minor because: (1) it impacts the procedure quality attribute of the Initiating Events cornerstone; and (2) it affects the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations.

The inspectors determined that the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," because the finding is an event which contributes to the initiation of a plant transient. For the Phase I screening, the inspectors answered "no" to all three questions in the Initiating Events Cornerstone column; therefore, this finding was considered to be of very low safety significance (Green) (FIN 50-455/02-07-02).

### Enforcement

The turbine coupling windage shield covers are part of a non-safety related system; therefore, instructions to install the covers are not required by 10 CFR part 50 appendix B. No violation of NRC requirements occurred. The licensee entered the event into its corrective action program as CR 00125635 "U2 Main Turbine Overspeed Test Problems" dated October 2, 2002.



.2 Forced Outages

a. Inspection Scope

On October 15, 2002, Unit 1 automatically tripped as a result of a turbine controls failure. During the resulting forced outage the inspectors reviewed the licensee's evaluation of the trip and their troubleshooting and restart activities associated with the failure in the turbine digital electro-hydraulic control system. The inspectors verified that TSs and license conditions were met during the shutdown and prior to restart.

The inspectors also reviewed selected issues documented in CRs to determine if they had been properly addressed in the licensee's corrective actions program. 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 testing and/or reviewed test data to verify that the equipment tested met the TS, the Technical Requirements Manual, the UFSAR, and licensee procedural requirements, and demonstrated that the equipment was capable of performing its intended safety functions. The activities were selected based on their importance in verifying mitigating systems capability and barrier integrity. The inspectors used the documents listed in the Attachment to this report to verify that the testing met the frequency requirements; that the tests were conducted in accordance with the procedures, including establishing the proper plant conditions and prerequisites; that the test acceptance criteria were met; and that the results of the tests were properly reviewed and recorded. In addition, the inspectors interviewed operations, maintenance and engineering department personnel regarding the tests and test results.

The inspectors evaluated the following surveillance tests:

- Unit 1 Undervoltage Simulated Start of the train A Auxiliary Feedwater Pump Monthly Surveillance (October 3, 2002); and
- Unit 1 Motor Driven Auxiliary Feedwater Pump Monthly Surveillance (October 28, 2002).

In addition, the inspectors reviewed the issues that the licensee entered into its corrective action program to verify that identified problems were being entered into the program with the appropriate characterization and significance. The inspectors also reviewed the licensee's corrective actions for the issues documented in selected condition reports. 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 reviewed and evaluated the following temporary plant modification on risk-significant equipment:

- Engineering Change 337282, "Temporary Change to the Unit 1 Pressurizer Spray Line 1D Low Temperature Alarm Setpoint from 525°F to 520°F Due to Unexpected Decrease in Temperature Indication Only When Operating the 1D Reactor Containment Fan Cooler," Revision 0 (October 2002).

The inspectors reviewed this temporary plant modification to verify that the installation instructions were consistent with applicable design modification documents and that the modification did not adversely impact system operability or availability. The inspectors interviewed operations and engineering personnel as appropriate and reviewed the design modification documents and the 10 CFR 50.59 evaluations against the applicable portions of the UFSAR. The documents listed in the Attachment to this report were also used by the inspectors to evaluate this area.

b. Findings

No findings of significance were identified.

**Cornerstone: Emergency Preparedness**

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

The inspectors observed the emergency response activities associated with the simulator training completed on November 12, 2002. Specifically, the inspectors verified that the emergency classification and simulated notifications were properly completed, and that the licensee adequately critiqued the training. Additionally, the inspectors determined that the results were properly counted in the Performance Indicators for emergency preparedness.

In addition, the inspectors reviewed the issues that the licensee entered into its corrective action program to verify that identified problems were being entered into the program with the appropriate characterization and significance. The inspectors also reviewed the licensee's corrective actions for the issues documented in selected condition reports.

b. Findings

No findings of significance were identified.

**3. SAFEGUARDS**

**Cornerstone: Physical Protection (PP)**

3PP3 Response to Contingency Events (71130.03)

a. Inspection Scope

The inspectors reviewed the status of security operations and assessed licensee implementation of the protective measures in place as a result of the current, elevated threat environment.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES**

40A1 Performance Indicator Verification (71151)

**Cornerstone: Mitigating Systems**

.1 Safety System Unavailability Performance Indicators

a. Inspection Scope

The inspectors verified that the licensee had accurately reported the safety system unavailability performance indicators for the following systems:

- Safety System Unavailability - Emergency AC Power  
Safety System Unavailability - Heat Removal System (Auxiliary Feedwater)

The inspectors reviewed condition reports, Performance Indicator Data Elements, operating logs, maintenance history and surveillance test history for unavailability information for these systems from July 1, 2001 to June 30, 2002. The inspectors also reviewed the licensee's calculation of critical hours for both units and evaluated applicable safety system equipment unavailability against the performance indicator definition. The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

40A2 Problem Identification and Resolution (71152)

.1 Routine Reviews of Identification and Resolution of Problems

a. Inspection Scope

As discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action system at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Minor issues entered into the licensee's corrective action system as a result of inspectors' observations are generally denoted in the list of documents reviewed at the back of the report.

b. Findings

No finding of significance were identified.

.2 Detailed Review - Control of Plant Maintenance

Introduction

The inspectors reviewed the implications of several issues in maintenance control. The licensee had generated CR 115848, "Missing Component on NAL 7300 Circuit Card," and CR 118066, "Anomalies During 2LI-0932 NAL Card Replacement." The inspectors selected these condition reports for a periodic review.

a. Effectiveness of Problem Identification

(1) Inspection Scope

The inspectors reviewed CR 115848 and CR 118066 to verify that the licensee's identification of the problems were complete, accurate, and timely, and that the consideration of extent of condition review, generic implications, common cause, and previous occurrences was adequate.

(2) Issues

During the review, the inspectors noted the following two issues that related to the recognition, control, or implementation of plant maintenance:

- Although the licensee identified a discrepancy during the receipt inspection, the licensee did not tag the card to preclude installation in the plant. The licensee did not appear to track and evaluate the issue appropriately until this CR was written after the card was installed in the plant. Subsequently, corrective actions were initiated to replace the card.
- The licensee was unaware that the Refueling Water Storage Tank level channel 2L-932 became inoperable during the maintenance activity to replace the card. The licensee identified the instrument was inoperable after noting the trip status light came on with the reinstallation of the circuit card. The licensee did not

conduct an adequate review of the maintenance impact on operability prior to performing the work. Because the Limiting Condition for Operation had not been exceeded, this was considered a minor issue.

### .3 Foreign Material Exclusion Controls

#### Introduction

During the Unit 2 refueling outage completed in October 2002, the inspectors identified several examples that indicated poor implementation of the licensee's foreign material exclusion (FME) controls program. The FME program was established to prevent undesired material from entering or being left in plant systems when they were breached during maintenance and testing activities. As a result of the inspectors observations the licensee generated two CRs. Subsequently the inspectors determined that a review of the recent station history with respect to the implementation of their FME controls was warranted.

The inspectors reviewed a list of FME-related CRs generated between January 1, 2000, and October 30, 2002. This list contained approximately 225 condition reports; however, after a review of the CR details it was determined that only about one half of the issues concerned FME program implementation deficiencies or problems resulting from foreign material. The inspectors selected the following condition reports more detailed reviewed.

- CR B2001-01806; FME Issues on the Unit 2 Turbine, April 17, 2001;
- CR B2001-01811; Ineffective Corrective Actions for Maintaining Concise and Accurate FME Logs on Turbine (S-W), April 18, 2001;
- CR B2001-02819; Common Cause Identified While Performing Common Cause Analysis for Action Tracking #50684 Assignment 2 (FME Control), June 21, 2001;
- CR 112862; Unit 2 Shutdown Due to 2C Steam Generator Tube Leak, June 22, 2002;
- CR 123810; 2C Steam Generator Foreign material Induced Tube Leak, September 9, 2002;
- CR 124395; NRC Inspector Discussion and Question of FME Practices, September 24, 2002;
- CR 125685; Clear Plastic and Grey Tape Found in Fuel Handling Building, October 3, 2002; and
- CR 126155; Potential Adverse Trend - Foreign Material Exclusion, October 7, 2002.

#### a. Effectiveness of Problem Identification

##### (1) Inspection Scope

The inspectors reviewed recent issues, associated with foreign material controls to verify that the licensee's identification of related problems was complete, accurate, and timely. The inspectors also verified that the licensee's consideration of the extent of condition review, generic implication, and common cause was adequate. The inspectors review of the effectiveness of problem identification focused specifically on issues during the Unit 2 refueling outage completed in October 2002.

(2) Issues

Although the licensee had identified and documented several foreign material issues, approximately 35 condition reports associated with foreign material controls were generated during the Unit 2 refueling outage, two of the condition reports were generated because of inspectors' observations. These two condition reports, CR 124395 and CR 125685, indicated poor licensee performance in identifying problems associated with their foreign material controls. Specifically:

- CR 124395, during refueling activities, the inspectors noted material being removed from the FME area established around the Unit 2 reactor cavity, that was never initially logged into the area. In addition, the inspectors noted some of the material being removed were small parts from a piece of equipment that broke. The supervisor at the reactor cavity was not cognizant of certain specifics of the FME control program. Subsequent to the inspectors' inquiries, the licensee evaluated the FME issues and subsequently generated a condition report regarding the event. However, the initial condition report generated only addressed the technical issues and failed to include the human performance issue regarding the supervisor's and workers' less-than adequate understanding of the FME program. After additional questions by the inspectors, the licensee addressed these human performance issues.
- CR 125685, during a walkdown of the fuel handling building, the inspectors identified numerous examples of transparent material such as plastic bags, plastic wrap and survey map protective sleeves. This was contrary to the placard posted at the entrance to the fuel handling building, which prohibited such material. Furthermore, discussions with a technician inside the fuel handling building indicated a lack of sensitivity for the requirements prohibiting clear material in the refueling building. The inspectors informed licensee's management of the conditions observed and a CR was written to address the concerns.

Toward the end of the Unit 2 refueling outage, the licensee's nuclear oversight organization generated CR 126155, identifying a potential adverse trend associated with the licensee FME controls. The inspectors considered the observations noted by nuclear oversight in CR 126155 to be a good example of identifying potential adverse trends. However, the evaluation of this CR was less than adequate as described below.

b. Prioritization and Evaluation of Issues

(1) Inspection Scope

The inspectors reviewed licensee's evaluation and disposition of recurring foreign material controls issues over the last 2 years with a specific focus on the issues evaluated in 2002 particularly CRs 112862, 126155 and 123810.

(2) Issues

Condition Report 112862 was generated as a result of the Unit 2 steam generator tube leak repair completed in June 2002. This condition report resulted in a common cause analysis of station-wide foreign material related issues, which assessed foreign material-related condition reports between January 1, 2001 through July 30, 2002. During this period, 60 condition reports were written related to FME program performance issues. The licensee utilized INPO's Anatomy of an Event Model to evaluate their results, and determined the following:

- A potential common cause associated with a lack of management/supervisory oversight/ownership of the FME program as illustrated by:
  - failure to correct long-term, degraded FME barrier concerns;
  - ineffective management of the FME program;
  - repeat failures of supervisors to document FME requirements; and
  - repeat failures of FME controls at the work areas.
- The most common failed defense was a failure to adhere to procedures.
- The most common error precursor was unclear/confusing expectations.

The inspectors considered this common cause analysis thorough, with the exception that it did not address why previous corrective actions were ineffective in preventing recurrence. The corrective actions resulting from this common cause analysis were implemented prior to the start of the September 2002 Unit 2 refueling outage.

Condition Report 126155, was initiated by the stations nuclear oversight organization around the end of the Unit 2 refueling outage, and identified a potential adverse trend associated with FME controls at the Byron Station. The licensee closed out the evaluation to an existing root cause analysis associated with CR 123810, regarding the Unit 2 steam generator tube leak.

Condition Report 123810, was generated to evaluate the FME-related aspects of the Unit 2 steam tube leak and other FME issues identified during the Unit 2 refueling outage and those described in CR 112862. The licensee's root cause review simply took credit for the review completed on CR 112862, and stated that the addition 35 FME-related conditions reports generated during the Unit 2 refueling outage had the same potential common cause of ineffective management/supervisory ownership/oversight of the FME program.

The inspectors noted the following shortcomings:

- There was no evidence that the licensee used an analytical method in evaluating the 35 FME-related condition reports generated during the Unit 2 refueling outage;
- The root cause failed to address and assess why the corrective actions from CR 112862 initiated prior to the Unit 2 refueling were ineffective as evidenced by the 35 more FME-related issues occurred during the Unit 2 refueling outage; and
- The root cause of ineffective management/supervisory ownership/oversight as identified in the root cause analysis was at a relatively high level as described by the TAPROOT process. Had the licensee utilized the rest of the TAPROOT method to evaluate the FME-related issues, a more focused root cause could have been determined.

c. Effectiveness of Corrective Actions

(1) Inspection Scope

The inspectors reviewed multiple condition reports associated with foreign material controls generated over the last 2 ½ years to determine the adequacy of the corrective actions.

(2) Issues

In general, the licensee's corrective actions for addressing the recurring FME-related problems have been ineffective to prevent recurrence as evidenced by the 35 condition reports initiated during the Unit 2 refueling outage. The ineffectiveness of the corrective actions has been noted by the licensee in several condition reports including:

- CR B2001-01811, "Ineffective Corrective Actions for Maintaining Concise and Accurate FME Logs on Turbine," April 18, 2001;
- CR B2001-01482, "Insufficient Rigor for FME Zone 1 controls on Unit 2 Turbine," April 8, 2001;
- CR 00111306, "Ineffective Corrective Actions for Action Report 56221 (regarding turbine FME issues)," June 10, 2002;
- CR 112862; "Unit 2 Shutdown Due to 2C Steam Generator Tube Leak," June 22, 2002; and
- CR 126155; "Potential Adverse Trend - Foreign Material Exclusion," October 7, 2002.

In addition, the inspectors noted that a corrective action to 124395 to have the Exelon Corporate Office review Fleet-wide FME practices was inappropriately closed before the review was initiated.

Although the licensee's corrective actions to prevent recurring FMW program implementation problems were not completely effective, the specific issues reviewed did not reach the threshold to be considered a significant condition adverse to quality, and therefore, the failure to prevent recurrence is not considered a violation of 10 CFR 50 Appendix B, Criteria 16, "Corrective Actions." However, the licensee generated Condition Report 138308, "Additional Review of FME Issues Warranted," dated January 6, 2003, to review the issues described in this report.



40A3 Event Follow-up (71153)

- .1 (Closed) Licensee Event Report (LER) 50-454-2002-001-00 Supplement 1: “Multiple Main Steam Safety Valve (MSSV) Relief Tests Exceeded Required Tolerance Due to Disk to Nozzle Metallic Bonding and Setpoint Drift.” This LER supplement provided new information associated with the most recent test results of Unit 2 MSSVs from the fall of 2002. All six Unit 2 valves tested passed without disk bonding, however it was noted in the LER that this testing occurred after only 76 days of operations. These test results are being factored into the licensee’s ongoing evaluation of this issue. The inspectors reviewed this LER supplement and no findings of significance were identified. The original LER was reviewed by the NRC in Inspection Report 50-454/02-05 and the licensee entered the original event into its action tracking system as CR 98531. This event did not constitute a violation of NRC requirements. This LER supplement is closed.
  
- .2 (Closed) LER 50-454-2002-003-00: “Two Automatic Reactor Trips Due to Reactor Coolant Overtemperature Conditions Caused by Digital Electro-Hydraulic Control System Circuit Card Failure causing the Turbine Governor Valves to Close.” On October 15, 2002, the Unit 1 reactor automatically tripped due to a reactor coolant over temperature condition. The cause of the overtemperature condition was the turbine governor valves closing, which caused a loss of turbine load. The turbine governor valves closed due to a malfunction of the digital electro-hydraulic control (DEHC) system, however the licensee was unable to identify the specific cause of the control system malfunction. Based on the symptoms of the event, the licensee identified four circuit cards with a high probability of causing this type of malfunction. These cards were replaced, and the DEHC was tested satisfactorily. Since the specific cause of the DEHC failure was not identified, the licensee installed additional monitoring equipment to the DEHC prior to restarting the reactor. On November 7, 2002, the Unit 1 reactor again automatically tripped due to an overtemperature condition. The scenario of the second trip was very similar to the first trip. However, this time diagnostic testing of the DEHC system revealed a failure of the Bit Logic (BL3) circuit board in the DEHC computer. Subsequently the licensee determined that the Bit Logic card failure was the cause of both reactor trips, and since the failure was intermittent in nature, it could not be diagnosed following the first reactor trip. The licensee identified the specific chip on the circuit board that had failed, and further analysis is being conducted to determine the cause of the chip failure. The circuit board was replaced, successfully tested and the reactor was restarted. Additionally, the licensee concluded that there were no safety consequences impacting plant or public safety because the unit was designed to cope with loss of turbine events. The inspectors reviewed the licensee’s investigation and had no findings. The licensee entered these events into its action tracking system as CRs 127501 and 130658. This event did not constitute a violation of NRC requirements. This LER is closed.

#### 40A4 Cross-Cutting Findings

- .1 A finding described in Section 1R15 of this report had, as its primary cause, a human performance deficiency, in that, the licensee, declared the degraded 2B SX pump operable without sufficient justification.

#### 40A5 Other Activities

- .1 Completion of Appendix A to TI 2515/148, Revision 1

The inspectors completed the pre-inspection audit for interim compensatory measures at nuclear power plants, dated September 13, 2002.

#### 40A6 Meetings

- .1 Exit Meeting

The inspectors presented the inspection results to Mr. S. Kuczynski and other members of licensee management at the conclusion of the inspection on January 7, 2003. The inspectors acknowledged that one proprietary document was reviewed during the course of the inspection. However, no proprietary information was included in this report.

- .2 Interim Exit Meetings

Interim exits were conducted for:

- Maintenance Rule Implementation - Periodic Evaluation with Mr. S. Kuczynski on October 24, 2002.
- Licensed Operator Requalification with Mr. R. Lopriore on October 18, 2002, with a subsequent telephone conversation with Mr. J. Heaton on November 5, 2002.

#### 40A7 Licensee-Identified Violations

The following violation of very low significance was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Manual, NUREG-1600, for being dispositioned as a Non-Cited Violation.

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

10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," requires that activities affecting quality shall be prescribed and accomplished by procedures appropriate to the circumstances. As described in CR 00108788, "MS [Main Steam] PORV [Power Operated Relief Valve] Isolation/Block Valve [1/2MS019A/B/C/D] PM [periodical maintenance] Improvements" the licensee identified that the 5 year lubrication requirements were not being met as specified because the licensee's instructions as provided in the predefined task did not call out a lubrication change. The manual valve operators being discussed for the MS PORV block valves have shown failures in the past however, it could not be shown with certainty that it was due to inadequate

maintenance. In addition, the valves are cycled quarterly for MS PORV strokes and operability was not affected.

## KEY POINTS OF CONTACT

### Licensee

R. Lopriore, Site Vice President  
S. Kuczynski, Plant Manager  
B. Altman, Maintenance Manager  
D. Combs, Site Security Manager  
D. Goldsmith, Radiation Protection Director  
B. Grundmann, Regulatory Assurance Manager  
D. Hoots, Operations Manager  
W. Kolo, Work Management Director  
T. Roberts, Engineering Director  
D. Spoerry, Training Manager

### Nuclear Regulatory Commission

A. Stone, Chief, Projects Branch 3, Division of Reactor Projects

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened

|                 |     |  |
|-----------------|-----|--|
| 50-455/02-07-01 | FIN | Failure to adequately evaluate the operability of the 2B SX due to the 30 drop/minute oil leak                               |
| 50-455/02-07-02 | FIN | Failure of the governor side turbine coupling windage shield cover on the unit 2 A low pressure turbine coupling number four |

### Closed

|                  |     |   |
|------------------|-----|---|
| 50-455/02-07-01  | FIN | Failure to adequately evaluate the operability of the 2B SX due to the 30 drop/minute oil leak  |
| 50-455/02-07-02  | FIN | Failure of the governor side turbine coupling windage shield cover on the unit 2 A low pressure turbine coupling number four  |
| 50-454/02-001-01 | LER | Multiple main steam safety valve relief tests exceeded required tolerance due to disk to nozzle metallic bonding and setpoint drift   |
| 50-454/02-003-00 | LER | Two automatic reactor trips due to reactor coolant overtemperature conditions caused by digital electrohydraulic control system circuit card failure causing the turbine governor valves to close |

### Discussed

None

## LIST OF DOCUMENTS REVIEWED

### 1R01 Adverse Weather Protection (7111101)

Byron Operating Procedure (BOP) XFT-1; Cold Weather Operations, Revision 1

Unit 0 Byron Operating Surveillance Requirement Procedure (BOSR) XFT-A1; Freezing Temperature Equipment Protection Station Heating and Department Support Requirements, Revision 8

0BOSR XFT-A2; Freezing Temperature Equipment Protection Auxiliary Steam Boilers, Revision 0

0BOSR XFT-A3; Freezing Temperature Equipment Protection Plant Ventilation Systems, Revision 0

0BOSR XFT-A4; Freezing Temperature Equipment Protection Protected Area Buildings Ventilation Systems, Revision 0

0BOSR XFT-A5; Freezing Temperature Equipment Protection Non-Protected Area Buildings Ventilation Systems, Revision 0

Focus Area Self Assessment Report; Adverse Weather Preparations (Cold Weather), August 5, 2002 through September 20, 2002

Condition Report (CR) 00093996; Procedure Revision Not Implemented for Modification (ENGR), February 6, 2002

CR 00084023; Winter Readiness - Procedure Enhancements, November 27, 2001

CR 00083995; Winter Readiness - Turbine Building Material Condition, November 27, 2001

CR 00080503; River Screen House Intake Bays Condition, October 26, 2001

CR 00080611; Leaves at Unit 2 Circulating Water (CW) Pump Intake Screens, October 27, 2001

CR 00081849; Results of River Screen House diver Inspections, November 6, 2001

CR 00087991; River Icing Causes Loss of Circulating Water (CW) Make-up Flow, December 25, 2001

CR 00087998; The CW Leaf Auger Trips/Freezes, December 25, 2001

CR 00087960; CW Warmup Line Not Placed in Service at Most Appropriate Time, December 23, 2001

CR 00090984; Freezing Concern with River Screen House Leaf Auger, January 17, 2002

CR 00132564; Problems Identified During Operating Assessment of Essential Service Water (SX) Make-up Pump Post Maintenance Testing

CR B2001-0311; Questionable Auxiliary Feed Pump Operability Due to Low Temperatures, July 16, 2001

1R04 Equipment Alignment (7111104)

Byron Station Technical Specifications (TS)

Byron/Braidwood Stations UFSAR

BOP CW-E2; Unit 2 Circulating Water System Electrical Lineup, Revision 6

BOP CW-M2; Unit 2 Circulating Water System Valve Lineup, Revision 19

CR 129430; Diesel Fuel Oil Spill While filling 125K Diesel Oil (DO) Tank, October 29, 2002

CR 133956<sup>1</sup>; EOP Valves Found Not to Have EOP Tags, December 03, 2002

CR 133936<sup>1</sup>; NRC and Illinois Department of Nuclear Safety Concern on Confined Space Policy, December 03, 2002

CR 133886<sup>1</sup>; Junction Boxes Missing Fasteners and Housekeeping Issues, December 03, 2002

BOP WS-M2; Non-Essential Service Water System Valve Lineup, Revision 31

Drawing M-54 Sheet #1B; Diagram of Service Air, Revision AG

Drawing M-54 Sheet #1A; Diagram of Service Air Turbine Building and Circulating Water Pump House, Revision AE

BOP AF-M2C; Unit 2 Auxiliary Feedwater System Train "C" Valve Lineup, Revision 1

BOP-AF-E2C; Unit 2 Auxiliary Feedwater Train "C" Electrical Lineup, Revision 1

BOP AF-M2A; Unit 2 Auxiliary Feedwater System Train "A" Valve Lineup, Revision 3

BOP AF-E2A; Unit 2 Auxiliary Feedwater Train "A" Electrical Lineup, Revision 1

BOP SA-1; Operation of the Station Air Compressors, Revision 20

BOP IA-M1; Instrument Air System Valve Lineup, Revision 31

BOP IA-E2; Instrument Air Electrical Lineup, Revision 2

BOP IA-2; Station Instrument Air Dryer Shutdown/Aligning For Emergency Bypassing, Revision 14

BOP SA-E3; Service Air Electrical Lineup, Revision 2

BOP SA-E2; Service Air Electrical Lineup, Revision 1

BOP FO-M2; Main Feedwater System Valve Lineup, Revision 12

BOP FO-E2; Feedwater System Electrical Lineup, Revision 4

BOP SX-M2A; Train "A" Essential Service Water System Valve Lineup, Revision 3

BOP SX-E2A; Essential Service Water Train "A" Electrical Lineup, Revision 1

Drawing M-36 Sheet #1B; Diagram of Feedwater (Main), Revision AW

Drawing M-36 Sheet #1C; Diagram of Feedwater (Main), Revision AW

Drawing M-36 Sheet #2; Diagram of Feedwater (Main), Revision AB

Drawing M-36 Sheet 1A; Diagram of Feedwater (Main), Revision AV

CR 123961; Flood Barrier Installation Impedes SX Valve Replacement Work, September 21, 2002

CR 124233; 0SX138B Actuator Degradation and Missed Opportunity, September 23, 2002

CR 49044; Insulation Removal Required for In-service Inspection Component Support Visual Exams, March 31, 2002

CR 130233; 1B SX Pump Inboard Seal Cooling Line, November 4, 2002

CR 130103; 1B SX Pp Has Leak From Cooling Line to Seal Housing, November 4, 2002

CR 119100; 2B SX Strainer - Leak at Drain Line 2WE82BB Threaded Connection, August 13, 2002

CR 123961; Flood Barrier Installation Impedes SX Valve Replacement Work, September 21, 2002

CR 124233; 0SX138B Actuator Degradation and Missed Opportunity, September 23, 2002

CR B2001-00985; Out of Service Hung Before Schedule Start Adding to LAO Time, March 5, 2001

CR B2001-1168; 2fi-sx121, 125, 123 Out of Tolerance, Expanded Tolerance Exceeded, March 19, 2001

CR B2001-01414; SX Piping Wall Thickness Violation, April 4, 2001

CR B2001-01516; Excess Paint on Jacket Water Heat Exchanger, April 8, 2001

CR B2001-01641; Orientation of 2SX194 Valve Not to Expected Position, April 12, 2001

CR B2001-01812; Incorrect O-Ring Installed in 2SX01PB, April 18, 2001

CR B2001-03207; OC SX Natural Draft Cooling Tower Fan Trip, July 22, 2001

CR B2001-03292; Unexpected Alarms Generated by Electrical Maintenance Mechanic's From Unit 2 Remote Shutdown Panel, July 26, 2001

CR B2001-03372; Technical Specification Valve Exceeded Stroke Time During Time Testing, August 2, 2001

CR 80479; Foreign Material Exclusion (FME) Concern, October 26, 2001

CR 87394; Inadequate Planning Causes Delays in Starting "VOTES" Testing, December 12, 2001

1R05 Fire Protection (7111105)

Byron/Braidwood Stations Fire Protection Report; Revision 19

Byron Administrative Procedure 1100-7; Fire Prevention for Transient Combustibles; Revision 10

Byron Administrative Procedure 1100-7A1; Minor Transient Combustibles; Revision 1

Byron Administrative Procedure 1100-9; Control, Use, and Storage of Flammable and Combustible Liquids and Aerosols; Revision 6

CR 128030<sup>1</sup>; Auxiliary Building Floor Equipment Opening Not Sealed With Caulk; dated October 18, 2002

Work Request (WR) 00070854<sup>1</sup>; Paint Over Incorrect Stenciling on Auxiliary Building Floor Plugs; dated October 25, 2002

CR 116511; Combustibles Found in Auxiliary Building Without Transient Fire Permit, July 18, 2002

CR 117789; Unattended Combustible Material - Ineffective Corrective Actions, August 1, 2002

CR 125245; Uncontrolled Transient Fire Load



CR 131850; Flush of R.H. Fire Protection Hoses Dislodges Debris, November 15, 2002

CR 122932; Unplanned Limiting Condition for Operation Action Requirement (LCOAR) Entry for Fire Detection, September 14, 2002

CR 129733<sup>1</sup>; Housekeeping/Fire Protection Concerns in the Auxiliary Building; dated October 31, 2002

CR 134445; Transient Fire Load in Work Execution Center Addressed, December 6, 2002

CR 134531; Concerns of Missing Sealant for Main Control Room Fire Door, December 9, 2002

CR 134683<sup>1</sup>; Gaps for doors and door frames, December 12, 2002

Engineering Change Type Evaluation (EC-EVAL) 339805; Fire Door Acceptance Criteria; Revision 0

OBMSR 3.10.g.4; Fire Door Semi-Annual Inspection, Revision 4

1R06 Flood Protection Measures (71111.06)

Byron Station Technical Specifications, Section 3.7

Byron/Braidwood Stations Updated Final Safety Analysis Report (UFSAR), Sections 2.4 and 3.4

Byron Abnormal Operating Procedure (BOA) ENV-2; Rock River Abnormal Water Level Unit 0; Rev. 4, Approved May 13, 1997

1R11 Licensed Operator Requalification (71111.11)

Nuclear Station Procedure (NSP) OP-AA-101-111; Rules and Responsibilities of On-Shift Personnel, Revision 0

NSP OP-AA-103-102; Watchstanding Practices, Revision 0

NSP OP-AA-103-103; Operation of Plant Equipment, Revision 0

NSP OP-AA-103-104; Reactivity Management Control, Revision 0

NSP OP-AA-104-101; Communications, Revision 0

Simulator Scenario; Cycle 02-06 00B, Revision 0

NSP OP-AA-104-101; Communications; Revision 0

NSP OP-AA-105-101; Administrative Process For NRC License And Medical Requirements; Revision 1

NSP OP-AA-105-102; NRC Active License Maintenance; Revision 2

NSP TQ-AA-106; Licensed Operator Requalification Training Program; Revision 1

NSP TQ-AA-131; Senior Reactor Operator - Limited Requalification Training; Revision 0

NSP TQ-AA-301; Simulator Configuration Management; Revision 1

NSP TQ-AA-302; Simulator Certification Testing and Reporting; Revision 2

Byron Simulator American National Standards Institute (ANSI)/American Nuclear Society (ANS)-3.5-1985 Certification Annual Update; September 2001

Byron Simulator ANSI/ANS-3.5-1985 Certification Annual Update; September, 2002

Regulatory Guide 1.134; Medical Evaluation of Nuclear Power Plant Personnel Requiring Operator Licenses; Revision 1

ANS-3.4; Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants; Revision Dated 1983

Licensed Operator Requalification Exam Sample Plan 2001-2002

WD.5-3; Simulator Work Requests (status); August 2001

2002 Licensed Operator Requalification Training (LORT) Simulator Evaluation Annual Test Scenarios for Weeks of September 16 through October 14, 2002

2002 LORT Operating Test Job Performance Measures

2001 Licensed Operator Requalification Biennial Written Examinations (Reactor Operator and Senior Reactor Operator)

2002 LORT Weekly Training Attendance Sheets

2002 Licensed Operator Proficiency Watch Records

Selection of Nine Licensed Operator Medical Records (five Senior Reactor Operator; four Reactor Operator)

2002 LORT Curriculum Review Committee Meeting Minutes

CR 00105817; Byron LORT Classroom Procedure 47 Days Out of Date

CR 00102690; LORT Study Materials Not Available

CR 00078415; Command and Control Standard Inconsistencies

CR 00078945; Byron Emergency Procedure (BEP) ES-1.3 Found To Contradict UFSAR Description

CR 00086904; Delta-I Control

CR 00085115; Reporting Requirements for Reassignment of Licensed Operators

CR 00098446; Deficiencies Found During LORT NRC 71111 Assessment

CR 00100294; Simulator Malfunction Cause and Effects Book Discrepancies

CR 00100381; Byron Annual Requalification Exam 2001 Improper Question Use

CR 00089495; Training Schedule Causes Poor Performance in Testing

CR 00113147; NRC Active License Tracking

CR 00115537; LORT/Initial Training

CR 00118936; Training Exam Reviews Missing Intent

CR 00120278; Infrequent Initial License Training, Shift Technical Advisor, and Shift Manager Curriculum Review Committees

CR 122920; Non-Conservative Reactor Operator No-Solo Policy

CR 136997<sup>1</sup>; Formal Guidance For Loss of All Annunciators Requested, December 20, 2002

1R12 Maintenance Rule Implementation (7111112)

CR 123893; Motor Operated Valve Stem Lubrication; September 20, 2002

Byron Station Maintenance Rule Periodic Assessment #3 (January 1999 - June 2000); October 30, 2000

Byron Station Maintenance Rule Periodic Assessment #4 (July 2000 - December 2001); August 21, 2002

NSP ER-AA-310; Implementation of the Maintenance Rule; Revision 1

NSP ER-AA-310-1001; Maintenance Rule Scoping; Revision 0

NSP ER-AA-310-1002; Maintenance Rule - Structures, Systems, and Components [SSC] Risk Significance Determination

NSP ER-AA-310-1003; Maintenance Rule - Performance Criteria Selection; Revision 0

NSP ER-AA-310-1004; Maintenance Rule - Performance Monitoring; Revision 0

NSP ER-AA-310-1005; Maintenance Rule - Dispositioning Between (a)(1) and (a)(2); Revision 0

NSP ER-AA-310-1006; Maintenance Rule - Expert Panel Roles and Responsibilities; Revision 0

NSP ER-AA-310-1007; Maintenance Rule - Periodic (a)(3) Assessment; Revision 0

BB PRA-017.04; Byron Probabilistic Risk Assessment Application Notebook - Maintenance Rule Performance Criteria; February 1, 2002

List of Byron Systems in (a)(1) During (a)(3) Assessment Period #4 (July 2000 - December 2001); December 31, 2001

List of a Maintenance Rule Functions in Scope; December 14, 2001

List of Maintenance Rule Functional Failures (July 2000 - December 2001); October 16, 2002

Maintenance Rule Performance Criteria; December 14, 2001

Maintenance Rule Unavailability and Reliability Data; October 21, 2002

Maintenance Rule (a)(1) Disposition Checklist and Documentation Summary (Corrective Actions for Those Functions in (a)(1))

Scoping Changes During July 2000 - December 2001; October 2002

List of Functions Removed or Added to the Maintenance Rule Program; October 2002

List of Corrective Work Requests Auxiliary Feedwater, CW, Diesel Generator, and SX (2001-2002); October 2002

List of CRs for SX, Auxiliary Feedwater, CW, DG (2000 - 2001); October 2002

Monthly Ship System Report (SX, Auxiliary Feedwater, CW, DG); September 2002

Maintenance Rule - Performance Monitoring (Availability Graph - October 2000 to October 2002 - SX, DG, CW, AF); October 2002

CR 108788; Main Steam Power Operated Relief Valve Isolation /Block Valve Preventative Maintenance Improvements, May 20, 2002

CR 108839; Dark, Fine Debris Found in Pilot Valve of 1FW540, Feedwater Regulating Valve

NSP ER-AA-310; Implementation of the Maintenance Rule, Revision 1

Maintenance Rule - Out of Service Report For Charging and Residual Heat Removal Pump Room Coolers, December 11, 2002

CR 128061; Unplanned LCOAR 2B Charging Pump, October 18, 2002

Maintenance Rule - Performance Criteria; Auxiliary Building HVAC (VA) and Essential Service Water (SX) Portions of Equipment Cubicle Coolers for the CV and RH Pumps, November 7, 2002

Maintenance rule - Evaluation History, October 28, 2002

CR B2001-03321; 1SX147B Functional Failure; July 27, 2001

CR B2001-02652; 1SX147B Failed to Stroke Open/Stroke Time Test During Surveillance; June 12, 2001

CR B2001-02986; 0G Low Speed SX Fan Failure to Start; July 6, 2001

CR B2001-03207; 0C SX Natural Draft Cooling Tower Fan Trip; July 22, 2001

CR 111077; 2B CW Pump Trip During Attempted Restart; July 25, 2002

CR 102699; 0B CW Make-up Pump Trip; May 14, 2002

Performance Criteria Changes During July 2000 - December 2001; October 2002

Maintenance Rule Expert Panel Meeting Notes (7/12/00, 12/13/00, 01/12/01)

Assessment of the Effectiveness of Byron's Maintenance Activities via Implementation of the Maintenance Rule Program (October 1, 2002 to October 12, 2002); October 18, 2002

Assessment of the Effectiveness of Byron's Maintenance Activities via Implementation of the Maintenance Rule Program (November 19, 2001 to November 30, 2001); December 7, 2001

Byron Station Essential Service Water (SX) System Health Evaluation; July 2002

CR 00128750<sup>1</sup> ; Enhancements to the Maintenance Rule Program Based on NRC Inspection

1R13 Maintenance Risk Assessments And Emergent Work Control

BOP 400-47; Online Risk/Protected Equipment, Revision 2

Nuclear Station Procedure (NSP) WC-AA-101; Online Work Control Process, Revision 6

NSP WC-AA-103; Online Maintenance, Revision 4

Shift Logs; November 4, 5, 6, 13, 14, 2002

Shift Logs; November 11, 12, 2002

CR 130103; 1B SX Pump Has Leak From Cooling Line to Seal Housing, November 4, 2002

CR 131171; Loss of Flow on the 2B Charging Pump, November 11, 2002

CR 135813; DC Battery Charger 212 Failure, December 14, 2002

1R14 Personnel Performance During Non-routine Plant Evolutions (7111114)

Unit 2 Byron General Operating Procedure (BGP) 100-2A1; Reactor Startup, Revision 17

Unit 2 Byron Technical Surveillance Requirement Procedure (BVSR) XPT-23; Unit 2 Low Power Physics Test Program With the Westinghouse ADRC; Revision 6

CR 113221; Vent of 2A Steam Generator and Impact on Instruments, Mode Change; June 25, 2002

Shift Manager Log; October 15, 2002

Sequence of Events Recorder; Unit 1 Reactor (Rx) Trip, October 15, 2002

1BEP-0; Reactor Trip Or Safety Injection Unit 1, Revision 102

1BEP-ES-0.1; Reactor Trip Response Unit 1, Revision 101

Sequence of Events Recorder; Byron Unit 1, November 7, 2002

Shift Manager Log; November 7, 2002

2BGP 100-2A1; Reactor Startup, Revision 17

2BVSR XPT-23; Unit 2 Low Power Physics Test Program With the Westinghouse ADRC, Revision 6

CR 113221; Vent of 2A Steam Generator and Impact on Instruments, Mode change, June 25, 2002

NSP OP-AA-101-111; Rules and Responsibilities of On-Shift Personnel, Revision 0

NSP OP-AA-103-102; Watchstanding Practices, Revision 0

NSP OP-AA-103-103; Operation of Plant Equipment, Revision 0

NSP OP-AA-103-104; Reactivity Management Control, Revision 0

NSP OP-AA-104-101; Communications, Revision 0

1R15 Operability Evaluations (7111115)

CR 122932; Unplanned LOCAR Entry for Fire Detection; September 14, 2002

Byron Annunciator Response Procedure 1PM09J-C8; AFW Pp Diesel Rms; Revision 2

Byron Annunciator Response Procedure 2PM09J-C-15; U2 Diesel Driven Auxiliary Feed Pump, Revision 3

Byron Annunciator Response Procedure 2 PM09J-C-16; U2 Diesel Driven Auxiliary Feed Pump DAY TANK ROOM, Revision 2

CR 130103; 1B SX Pump Has Leak From Cooling Line to Seal Housing, November 4, 2002

CR 130248; 1SX001B Valve Would Not Stroke Fully Open

CR 130664<sup>1</sup>; Operability of 2B SX Pump

EC 3399734; Evaluation of Past Operability of 2B SX PUMP W/30 Drops Per Minute Oil Leak

NRC Generic Letter No. 91-18; Revision 1: Information To Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded and NonConforming Conditions

NRC Information Notice 97-78; Crediting of Operator Actions in Place of Automatic Actions and Modifications of Operator Actions, Including Response Times

CR 130703; 2B SX Pump Oil Leak - Failed Post Maintenance Testing

CR 132406; Parts for 2A CC Discharge Check Not Identified in BOM, November 20, 2002

CR 132650; Lockwire Size Does Not Match Size on Drawing for 2CC9463A, November 20, 2002

CR 133268; Loose Nut and 3/32" Lockwire on 1CC9463A, November 25, 2002

CR 133317; Replacement Valve Disc for 1CC9463A Does Not Match Installed, November 26, 2002

CR 134133; Residual Heat Removal Pump Bowl Stud Corrosion, December 5, 2002

Shift Manager Log; November 4, 5, 6, & 7, 2002

1R16 Operator Work-Arounds (7111116)

CR 96323; Comparison of Braidwood and Byron CWA/CC List, February 22, 2002

CR 128671<sup>1</sup>; Steam Generator Tube Leakage Program Values Questioned, October 23, 2002

CR 130375; 2BOA SEC-8 Unnecessary Entries, November 4, 2002

Shift Manager Log; October 23, 2002

Software Design Description for Steam Generator Leak Tracking, Revision 0.0

Software Requirement Specifications for Steam Generator Leak Tracking, Revision 0.0

CR 128007; Steam Generator Leak Tracker Program Inputs Causing High Indicated Leakage, October 18, 2002

CR 128988; Fission Gas Isotopes Detected in Steam Jet Air Ejector Sample, October 25, 2002

NSP OP-AA-102-1-3; Operator Work-Around Program, Revision 0

CR 131124; Primary/Secondary Leak Tracker Program Issues, November 10, 2002

CR 130209; Entry into 2BOA SEC-8, November 4, 2002

CR 130907; 1BOA Sec-8 Entry Due to Leak Tracker Program, November 9, 2002

CR 130987; 2BOA SEC-8 Entry, November 10, 2002

Unit 2 Air Inleakage Investigation, November 6 through November 8, 2002

Third Quarter 2002 Operator Work Around Aggregate Impact Assessment, November 9, 2002

Operator Work Around List for Byron Station; November 2002

Operator Work Around Committee Meeting Minutes, December 12, 2002

Operator Challenges List for Byron Station; November 2002

1R19 Post Maintenance Testing (7111119)

Technical Specification; TRM 2.7.a.6

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CR 111905; 2B Reactor Containment Fan Cooler LCOAR Delayed Due to Post Maintenance Testing Specified and Scheduled, June 13, 2002

CR 120928; Concern Relating to Post Maintenance Test Performed on 2VP01CA and 2VP01CC, August 28, 2002

CR 131171; Loss of Flow on the 2B Charging Pump, November 11, 2002

CR 132001; Seal Cooling Leakage on the 2B Charging Pump, November 17, 2002

CR 132009; 2B Charging Pump American Society of Mechanical Engineers (ASME) Data and In-service Testing (IST) Baseline, November 17, 2002

CR 00132406; Parts for 2A Charging Discharge Check Valve Not Identified

CR 132845; Inadequate 50.59 and Surveillance Approved for Use, November 16, 2002

CR 136515<sup>1</sup>; NRC Questioning of Data Used in EC339829, Flow Series Model, December 18, 2002

CR 136182; Post Maintenance Testing Specification Detail Improvement Area, December 17, 2002

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BOP SX-3; Essential Service Water Makeup Pump Startup, Revision 19, May 9, 2002

BOP SX-3TI; Essential Service Water Makeup Pump Operating Log

BOP SX-10; Essential Service Water Make-up Pump, Revision 6, dated February 12, 2000.

0BOSR 7.9.6-2; Essential Service Water Make-up Pump 0B Monthly Operability Surveillance; Revision 11, dated June 4, 2002

0BVSR 5.5.8.SX.1-2; Unit 0 Test of the 0B Essential Service Water Make-up Pump, Revision 4

0BVSR 2.7.a.6-1; Unit 0 Essential Service Water Makeup Pump 0A Prime Mover Inspection, Revision 2, Approved August 27, 1999.

2BVSR 5.2.4-6; ASME Surveillance Requirements For Centrifugal Charging Pump 2B and Chemical and Volume Control System Valve Stroke Test, Revision 6

2BVSR 5.5.8.cc.1-2; Unit 2 ASME Surveillance Requirement for Component Cooling Pump 2CC01PB (partial)

WR 00459144 02; Replace Gear Unit Oil Drain Plug Post Maintenance Testing Visual for Leakage

WR 00441539 02; Gear Unit Minor Oil Leak PMT Visual for Leakage

WR 00416406 02; Inspect Gear Drive PMT Visual for Leaks

2BOA TG-1; Turbine High Vibration, Eccentricity or Differential Expansion, Unit 2, Revision 100

2BGP 100-3; Power Ascension, Approved September 14, 2002

2BGP 100-2T3; Reactor Startup Flow Chart, Revision 3, August 14, 2002

2BGP 100-2T1; Plant Startup Flow Chart, Revision 12, September 10, 2002

2BGP 100-3T1; Power Ascension Flow Chart, Revision 12, September 14, 2002

Work Order (WO) 00509078; SEP - Performance Data Collection 2B CV Pump, November 16, 2002

WO 99103855; Perform Analysis To Verify Emergency Core Cooling System Flow Balance, November 16, 2002

BOP AF-7; Diesel Driven Auxiliary Feedwater Pump, Revision 21

WO Task 473738; OP-Perform Operability Test of 2B AF Diesel SSV Per EC338067, December 5, 2002

Configuration Change No. EC 338067, Revision 0

WO 468021; Replacement of 1B AF Diesel SSV Per EC 338067

Byron Station Plant Review Report (PR No. 02-048); Revision to TRM Section 2.1.9, Technical Specification Requirement (TSR) 2.5.c.2, November 13, 2002

NSP IT-AA-101; Digital Technology Systems (DTS) Quality Assurance Procedure, Revision 0

NSP IT-AA-101-1001; DTS Classification Determination Checklist for Flo-Series V.6.05, Revision 0

Software Action Approval Document 19990135; Flo-Series V.6.05, Hydraulic Network Analysis Program That Calculates Pressure Loss in Piping systems, June 16, 1999

Regulatory Guide 1.168; Verification, Validation, Reviews, And Audits For Digital Computer Software Used in Safety Systems of Nuclear Power Plants, September 1997

Information Notice 80-07; Pump Shaft Fatigue Cracking, February 29, 1980

Information Notice 88-87; Pump wear and Foreign Objects in Plant Piping Systems, November 16, 1988

Information Notice 89-15; Second Reactor Coolant Pump Shaft Failure at Crystal River, February 16, 1989

Information Notice 93-68; Failure of Pump Shaft Coupling Caused By Temper Embrittlement During Manufacture, September 1, 1993

Information Notice 94-76; Recent Failures of Charging/Safety Injection Pump Shafts, October 26, 1994

ASME/ANSI Oma-1988; ADDENDA to ASME/ANSI OM-1987 Operation and Maintenance of Nuclear Power Plants

NSP ER-AA-321; Administrative Requirements For Inservice Testing, Revision 3

Shift Manager Log; November 11, 2002

1R20 Refueling and Outage Activities (7111120)

TapRoot; The System for Root Cause Analysis Problem Investigation, and Proactive Improvement, Copyright 2000

2 BVSr 4.14.1-1; Unit 2 Reactor Coolant System pressure Isolation Valve and Cold Leg Injection Isolation Valve Leakage Surveillance; Revision 7

SPP 02-013; Full Flow Flush Through the CV Cold Leg Injection Lines; October 1, 2002

Shift Manager Log; October 3, 2002

CR 124032; Piping Flexible Hose Degradation, September 17, 2001

CR 124526; Communications and Procedure Problems with Unit 2 Reactor Head Set, September 25, 2002

CR 124924; RMCS Boron Concentration Is Less Than SDM During Loop Fill

CR 125275; Pressure Isolation Valve Leakage in Excess of Technical Specification Limits, October 1, 2002

CR 125306; Main Turbine Vibration System Built Wrong at Factory, September 28, 2002

CR 00125548; 2SI8900A Leakage After SI Flush; October 2, 2002

CR 00125610; Improvement Items Identified during Evaluation of SPP 02-013; October 2, 2002

CR 00125635; Unit 2 Main Turbine Overspeed Test Problems, dated October 02, 2002

CR 00125685<sup>1</sup>; Clear Plastic and Gray Tape Found in Fuel Handling Building (FHB), dated October 02, 2002

CR 00125829<sup>1</sup>; NRC Plant Walkthrough Feedback, dated October 03, 2002

CR 134868; Siemens Westinghouse Work Practice and Supervisor Oversight Process, December 10, 2002

Byron Letter 2002-0102; Steam Generator Tube Repairs Resulting from Byron Station, Unit 2, Cycle 10 Refueling Outage, October 8, 2002

Regulatory Guide 1.33; Quality Assurance Program Requirements (Operation), Revision 2

NSP MA-AA-716-008; Foreign Material Exclusion Program, Revision 0

Root Cause Report; Action Tracking Item Number 125635-02, Unit 2 Main Turbine Manual Trip Due to High Vibrations During Overspeed Trip Testing

1R22 Surveillance Testing (7111122)

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BOP AF-5; Motor Driven Auxiliary Feedwater Pump - A Startup on Recirc, Revision 12

BOP AF-5; Motor Driven Auxiliary Feedwater Pump - A Shutdown, Revision 14

BOP AF-MI; Auxiliary Feedwater System Valve Lineup, Revision 13

1BOSR 3.2.3-1; Unit One Undervoltage Simulated Start of A Auxiliary Feedwater Pump Monthly Surveillance; Revision 2

1 BVSr 3.5.1-1; Unit 1 Bus 141 Undervoltage Protection Monthly Surveillance; Revision 2

6E-1-4030EF01; Schematic Diagram ESF Sequencing and Actuation Cabinet Train A 1PA13J; Revision V

6E-1-4030AF01; Schematic Diagram Auxiliary Feedwater Pump 1A 1AF01PA; Revision AA

6E-1-4030AF14; Schematic Diagram Auxiliary Feedwater Pump 1A & 1B Discharge Test Valves 1AF004A & 1AF004B

CR 122234; Disparity in Post Charge Battery Surveillance Requirements; September 9, 2002

1BOSR 8.6.1-1; Unit One 125V DC Engineered Safety Feature Battery Bank and Charger 111 Operability Weekly Surveillance; Revision 5

454-315-97-099F-01; Byron Station Commitment; November 26, 1997

CR 115428; Auxiliary Feedwater TS Surveillance Requirements May Be Inadequate; July 12, 2002

2BOSR 7.5.3-2; Unit Two Diesel-Driven Auxiliary Feedwater Pump Quarterly Surveillance; Revision 7

1R 23 Temporary Plant Modifications (7111123)

Byron Annunciator Response Procedure 1-12-B6; Pressurizer Spray Line Temperature Low, Revision 4

NSP OP-AA-102-104; Unit 1 Standing Order - Temporary Setpoint Change - 1D PZR Spray Line Low Temperature Alarm

Engineering Change 337282; Decrease Unit 1 Loop 1D Pressurizer Spray Line Low Temperature Alarm Setpoint From 525 DEGF to 520 DEGF Due to 1D RCFC Impact on Temperature Indication For Remainder of Current Unit 1 Cycle, October 11, 2002

Engineering Evaluation for Byron Unit 1 Pressurizer Spray Line Low Temperature Alarm, September 11, 2002

50.59 Review TCCP-EC 337282: Temporary Change to the Unit 1 Pressurizer Spray Line 1D Low Temperature Alarm Setpoint from 525 Degrees F to 520 Degrees F Due to Unexpected Decrease in Spray Line Temperature Indication Only When Operating the 1D RCFC

1EP6 Drill Evaluation (71114-06)

CR 130303; Emergency Preparedness (EP) Performance Indicator (PI) for Drill and Exercise Performance (DEP) less than 93 percent, November 5, 2002

CR 00106461; EP PI for DEP remains less than 95 percent, May 2, 2002

CR 00104314; EP PI for DEP less than 95 percent, April 16, 2002

CR 00109960; EP PI for DEP remains less than 95 percent, May 30, 2002

Byron Unit 1 and 2 Emergency Response Organization Drill/ Exercise Performance calculations Q4/2001 - Q3 2002

NEI 99-02 Regulatory Assessment Performance Indicator Guideline, Revision 2,  
November 2001

4OA1 Performance Indicator Verification (71151)

NSP RS-AA-122-104; Performance Indicator Safety System Unavailability (HPSI/HPCS, RHR, AFW, RCIC, Emergency Diesel Generator), Revision 3

NSP LS-AA-2040; Monthly Performance Indicator (PI) Data Elements for Safety System Unavailability - Emergency AC Power, Revision 2

NSP LS-AA-2040, Attachment 1; Monthly Performance Indicator Data Elements for Safety System Unavailability - Emergency AC Power, Revision 2, July 2001 through June 2002

NSP LS-AA-2060; Monthly Performance Indicator (PI) Data Elements for Safety System Unavailability - Reactor Core Isolation Cooling (Boiling Water Reactors) or Auxiliary Feedwater (Pressurized Water Reactors) Systems, Revision June 25, 2001

NSP LS-AA-2060, Attachment 1; Monthly PI Data Elements for Safety System Unavailability - Reactor Core Isolation Cooling (Boiling Water Reactors) or Auxiliary Feedwater (Pressurized Water Reactors) Systems, July 2001 through June 2002

Unit Control Room Operator Logs

NEI 99-02; Regulatory Assessment Performance Indicator Guidelines, Revision 2

4OA2 Identification and Resolution of Problems (71152)

Institute for Nuclear Power Operation's Anatomy of an Event Model

NSP MA-AA-716-008; Foreign Material Exclusion Program, Revision 0

Operability Evaluation for CR 115548; Zener Diode Missing from 3 NAL Cards, July 19, 2002

Prompt Investigation Report: 2LT-932 Bistable Issue; August 2, 2002

Schematic 6E-2-4031SI03; Byron Unit 2 Loop Schem. Diagram Refueling Water Storage Tank Level (2LT-0932) Protection CAB 3 (2PA03J)

DEHC Control Problem Led to Governor Valves Closing and OTDT Rx Trip, November 19, 2002

Common Cause Analysis; Evaluation of FME Controls at Byron Station in Response to the Forced Outage for the Unit 2 Steam Generator Tube Leak (B2F23), August 15, 2002

Root Cause Analysis; Root Cause of Common Cause Found in B2R09 Turbine FME Events, December 14, 2001

CR B2001-01482; Insufficient Rigor for FME Zone 1 Controls on Unit 2 Turbine (Siemens-W Representative), April 8, 2001

CR B2001-01806; FME Issues on Unit 2 Turbine (NOS Issue-Placko), April 17, 2001

CR B2001-01811; Ineffective Corrective Actions for Maintaining Concise and Accurate FME Logs on Turbine (S-W), April 18, 2001

CR B2001-02819; Common Cause Identified While Performing CCA for AT #50684 Assignment 2 (FME Control), June 21, 2001

CR B2001-03329; FME Found in Check Valve, July 30, 2001

CR 101799; CR Generation and the B1R11 Outage Issues List, April 1, 2002

CR 112862; Unit 2 Shutdown Due to 2C Steam Generator Tube Leak, June 22, 2002

CR 111306; Ineffective Corrective Actions from CR # 562221, June 10, 2002

CR 115848; Missing component on NAL 7300 Circuit Card; July 16, 2002

CR 118066; Anomolie During 2LI-0932 NAL Card Replacement; August 3, 2002

CR 119511; Potential Issue with Application of Flexitallic Gaskets, August 15, 2002

CR 123867; NOS Has Question on FME Protection for Vertical Vents, September 18, 2002

CR 123845; Loose Paint Chip Fell Into Reactor Vessel - Retrieval Required, September 20, 2002

CR 123891; FME Barrier Not in Place, September 20, 2002

CR 99093; Fuel Pool Area FME Log Not Reconciled, March 14, 2002

CR 123612; Loose Debris Found on Guide Roller Cover For Unit 2 Refueling Outage, September 19, 2002

CR 123680; Foreign Material Found in Valve Internals, September 20, 2002

CR 123892; Miscellaneous FME Concerns Noted (OP), September 21, 2002

CR 123964; As-Found Condition During 10 Year RCP Motor Inspection, September 19, 2002

CR 123985; FME Introduced into MS Via 2MS020C/21C Pipe Preps, September 22, 2002

CR 124049; FME Found in System, September 23, 2002

CR 124229; FME Found in Valve 2SI1096, September 24, 2002

CR 124355; Flashlight Discovered in C Hood of Unit 2 Condenser, September 24, 2002

CR 124395<sup>1</sup>; NRC Inspector Discussion and Question of FME Practices, October 3, 2002

CR 124812; Debris found Inside the RCFCs During Cleaning in B2R10, September 27, 2002

CR 125028; Debris Found in Containment While Starting a RCP, September 29, 2002

CR 125124; Debris Found in TO Reservoir Strainer Basket - Post Outage, September 30, 2002

CR 125685<sup>1</sup>; Clear Plastic and Grey Tape Found in Fuel Handling Building

CR 126053; Loss of FME Area Integrity (LPA and LPB), October 6, 2002

CR 128462; Clear Plastic on Tool in Fuel Handling Building, October 22, 2002

CR 129941; More Foreign Material Discovered During Review of RF Video, September 27, 2002

CR 129626; Foreign Material Exclusion Qualifications for NLOs, October 30, 2002

CR 126155; Potential Adverse Trend - Foreign Material Exclusion, October 7, 2002

CR 129001; Foreign Material in Unit 1 Strainer Baskets, October 18, 2002

CR 129769; Foreign Material Found in Unit 2 Generator Excitor "Doghouse," October 31, 2002

CR 130023; Foreign Material Retrieved From ST Clarifier, November 2, 2002

CR 130380; Foreign Material in SX Basin, November 5, 2002

CR 137888<sup>1</sup>; Assignment Inappropriately Closed for Corporate FME Review, December 20, 2002

CR 138308<sup>1</sup>; Additional Review of FME Issues Warranted

CR B2000-02760; FME Concern, September 28, 2000

CR 99652; NRC Questioned the Use of "Clear Skin" Gloves in Foreign Material Exclusion Area Zone 1, March 18, 2002

Byron Station Plant Review Report 00-072; FME in SI Piping



CR B2001-01512; FME Procedural Compliance (Siemens Westinghouse), April 9, 2001

Root Cause Report; 2C Steam Generator Foreign Material Induced Tube Leak,  
December 4, 2002

TapRoot; The System for Root Cause Analysis Problem Investigation, and Proactive  
Improvement, Copyright 2000

4OA3 Event Follow-up (71153)

Shift Manager Log, October 15, 2002

CR 127501; Reactor Trip Due To Exceeding Over-Temperature Delta-T Setpoint,  
October 15, 2002

Sequence of Events Recorder; Unit 1 Reactor (Rx) Trip, October 15, 2002

1BEP-0; Reactor Trip Or Safety Injection Unit 1, Revision 102

1BEP-ES-0.1; Reactor Trip Response Unit 1, Revision 101

Sequence of Events Recorder; Byron Unit 1, November 7, 2002

CR 128134; Additional PZR PORV Concerns from Unit 1 Trip, October 15, 2002

CR 130699; B1F23 Containment Walkdown Results, November 7, 2002

CR 130717; DEHC Data Grabber Failed to Store Data During Unit 1 Trip, November 7,  
2002

CR 130658; Unit 1 Reactor Trip, November 7, 2002

Shift Manager Log, November 7, 2002

LER 2002-001-01; Multiple Main steam Safety Valve Relief Tests Exceeded Required  
Tolerance Due to Disk to Nozzle Metallic Bonding and Setpoint Drift, November 15,  
2002

LER 2002-003-00; Two automatic reactor trips due to reactor coolant overtemperature  
conditions caused by digital electrohydraulic control system circuit card failure causing  
the turbine governor valves to close, December 13, 2002

TapRoot; the System for Root Cause Analysis Problem Investigation, and Proactive  
Improvement, Copyright 2000

4OA7 Licensee-Identified Violations

CR 108788; Main Steam Power Operated Relief Valve Isolation/Block Valve  
Preventative Maintenance Improvements, May 20, 2002

CR B2000-03408; Unplanned LCOAR entry due to failure of 1MS019B to properly stroke, November 10, 2000

Apparent Cause Evaluation; The manual actuator for the 1MS019B valve was broken when isolating the associated SG PORV for a quarterly surveillance, January 6, 2001

1BEP3 WOG-1C; Steam Generator Tube Rupture Unit 1, Revision 101

2BEP3 WOG-1C; Steam Generator Tube Rupture Unit 2, Revision 101

<sup>1</sup> NRC Identified

## LIST OF ACRONYMS USED

|       |   |
|-------|---|
| ADAMS | Agency Wide Documents Access and Management System  |
| ANS   | American Nuclear Society                            |
| ANSI  | American National Standards Institute               |
| ASME  | American Society of Mechanical Engineers            |
| BGP   | Byron General Operating Procedure                   |
| BOA   | Byron Abnormal Operating Procedure                  |
| BOP   | Byron Operating Procedure                           |
| BOSR  | Byron Operating Surveillance Requirement Procedure  |
| BVSR  | Byron Technical Surveillance Requirement Procedure  |
| CFR   | Code of Federal Regulations                         |
| CR    | Condition Report                                    |
| CW    | Circulating Water                                   |
| DEP   | Drill and Exercise Performance                      |
| EP    | Emergency Preparedness                              |
| FME   | Foreign Material Exclusion                          |
| IMC   | Inspection Manual Chapter                           |
| JPM   | Job Performance Measure                             |
| LCOAR | Limiting Condition for Operation Action Requirement |
| LORT  | License Operator Requalification Training           |
| MR    | Maintenance Rule                                    |
| NRC   | United States Nuclear Regulatory Commission         |
| NSP   | Nuclear Station Procedure                           |
| SDP   | Significance Determination Process                  |
| SSC   | System Structure or Component                       |
| SX    | Essential Service Water                             |
| TS    | Technical Specification                             |
| UFSAR | Updated Final Safety Analysis Report                |
| WO    | Work Order  |
| WR    | Work Request  |