

April 24, 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 50-454/03-02; 50-455/03-02

Dear Mr. Skolds:

On March 31, 2003, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Byron Station, Units 1 and 2. The enclosed report documents the inspection findings which were discussed on April 4, 2003, with Mr. R. Lopriore 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.

Based on the results of this inspection, one NRC-identified and one self-revealed findings were identified. These findings were evaluated under the risk significance determination process as having very low safety significance (Green). These issues were determined not to involve violations of NRC requirements.

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 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 Temporary Instruction 2515/148 was completed at all commercial nuclear power plants 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 reviewed and dispositioned by the Office of Nuclear Security and Incident Response. For calendar year 2003, the NRC will continue to monitor overall safeguards and security

controls, conduct inspections, and resume force-on-force exercises at selected 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 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 (PARS) 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 50-454/03-02;  
50-455/03-02  
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  
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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: 50-454/03-02; 50-455/03-02

Licensee: Exelon Generation Company, LLC

Facility: Byron Station, Units 1 and 2

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

Dates: December 29, 2002 through March 31, 2003

Inspectors: R. Skokowski, Senior Resident Inspector  
P. Snyder, Resident Inspector  
T. Tongue, Project Engineer  
R. Alexander, Radiation Specialist

Observer: C. Thompson, Illinois Department of Nuclear Safety

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

Enclosure

## SUMMARY OF FINDINGS

IR 05000454-03-02, 05000455-03-02; Exelon Generation Company, LLC; on 12/29/02-03/31/03; Byron Station; Units 1 & 2. Maintenance Effectiveness and Operability Evaluations.

This report covers a 3-month period of baseline resident inspection and an announced baseline inspection on radiation protection. The inspections were conducted by a regional radiation specialist inspector and the resident inspectors. Two Green findings, none of which were violations of NRC requirements, 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 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. Inspector-Identified and Self-Revealed Findings

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

- Green. A finding of very low safety significance was identified through a self-revealing event when technicians failed to apply gasket sealant to the inboard and outboard bearing lube oil housings gaskets during the reassembly of the Unit 2 train A charging pump. This led to excessive oil leakage and required the pump to be removed from service for repair. The primary cause of this finding was related to the cross-cutting area of human performance, since proper gasket installation is a skill of the craft activity.

This finding is more than minor because the Unit 2 train A charging pump was returned to service with an existing deficiency similar to the greater than minor examples of Section 5 of Appendix E of Inspection Manual Chapter 0612. This finding is of very low safety significance because there was no design deficiency, no actual loss of safety function, no single train loss of safety function for greater than the technical specification allowed outage time, and no risk due to external events. No violations of NRC requirements occurred. (Section 1R12)

#### **Cornerstone: Barrier Integrity**

- Green. The inspectors identified a finding of very low safety significance regarding the licensee's failure to appropriately assess the operability of the nonaccessible area exhaust filter plenum ventilation system during a work activity to repair the discharge flow control damper for the 0A auxiliary building heating, ventilation and air conditioning system (VA) nonaccessible filter plenum exhaust fan. The primary cause of this finding was related to the cross-cutting area of human performance. The licensee failed to recognize that failing open an inlet damper within the system resulted in the associated train being inoperable.

This finding was more than minor because it involved an inadequate operability evaluation of the nonaccessible area exhaust filter plenum ventilation system, which if left uncorrected, would have become a more significant safety concern, in that, it would impact the operators' ability to combat an accident and minimize offsite exposure for certain accidents. This finding is of very low safety significance because it only represented a degradation of the radiological barrier function provided for the auxiliary building. No violations of NRC requirements occurred. (Section 1R15)

**B. Licensee Identified Violations**

No violations of significance were identified.

## Report Details

### Summary of Plant Status

Unit 1 operated at or near full power throughout the inspection period except on January 26, 2003, when power was reduced to about 77 percent for turbine throttle valve/governor valve testing, and on March 2, 2003, when power was reduced to about 80 percent for load following.

Unit 2 operated at or near full power throughout the inspection period except on January 5, 2003, when power was reduced to about 77 percent for turbine throttle valve/governor valve testing.

## **1. REACTOR SAFETY**

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

#### 1R04 Equipment Alignment (71111.04)

##### a. Inspection Scope

The inspectors performed partial walkdowns of accessible portions of trains of risk-significant mitigating systems equipment during times when the trains were of increased importance due to the redundant trains or other related equipment being unavailable. The inspectors utilized the valve and electric breaker checklists listed in the attachment at the end of this report and applicable system drawings to verify that the components were properly positioned and that support systems were lined up as needed. The inspectors also examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors used the information in the appropriate sections of the Updated Final Safety Analysis Report (UFSAR) to determine the functional requirements of the systems.

The inspectors verified the alignment of the following trains:

- Unit 2 essential service water train A on January 28, 2003;
- Unit 1 charging system train B on January 30, 2003;
- Unit 1 containment spray system train A, while B train was out-of-service on February 6, 2003; and
- Unit 1 emergency diesel generator train B, while the train A diesel was out-of-service on February 19, 2003.

##### b. Findings

No findings of significance were identified.

## 1R05 Fire Protection (71111.05)

### .1 Walkdowns

#### a. Inspection Scope

The inspectors conducted fire protection walkdowns that were focused on availability, accessibility, and the condition of fire fighting equipment; the control of transient combustibles and ignition sources; and on the condition and operating status of installed fire barriers. The inspectors reviewed applicable portions of the Byron Station Fire Protection Report and selected fire areas for inspection based on their overall contribution to internal fire risk, as documented in the Individual Plant Examination of External Events Report. The inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and that fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The documents listed in the attachment at the end of this report were also used by the inspectors to evaluate this area.

The inspectors examined the plant areas listed below to observe conditions related to fire protection:

- Unit 1 diesel generator cable tunnel (Zone 3.1-1) on January 16, 2003;
- Unit 2 upper cable spreading room (Zone 3.3B-2) on February 4, 2003;
- Unit 1 auxiliary building elevation 364' - 0" (Zone 11.3-0) on February 19, 2003;
- Unit 2 auxiliary building elevation 364' - 0" (Zone 11.3-0) on February 23, 2003;
- Auxiliary building elevation 364'-0" (Zone 11.3-2) on March 10, 2003;
- Unit 1 auxiliary electrical equipment room (Zone 5.5-1) on March 13, 2003;
- Unit 2 auxiliary electrical equipment room (Zone 5.5-1) on March 13, 2003;
- Unit 1 auxiliary building elevation 401'-0" (Zone 11.5-0) on March 21, 2003; and
- Unit 2 auxiliary building elevation 401'-0" (Zone 14.2-0) on March 21, 2003.

#### b. Findings

No findings of significance were identified.

## 1R07 Heat Sink Performance (71111.07)

#### a. Inspection Scope

On January 29, 2003, the inspectors observed the licensee's inspection of the following safety-related heat exchanger:

- Unit 1 centrifugal charging system train A pump room unit cooler heat exchanger.

This heat exchanger was selected for our review because the essential service water was ranked high in the plant specific risk assessment and was directly connected to the safety-related support to the charging system.

During the inspection, the inspectors discussed the results and heat exchanger performance with the system engineer and performed an independent inspection of the heat exchangers. The inspectors observed the internals of the coolers and the associated data in the respective work packages for any abnormalities and compared the as-found conditions to the acceptance criteria. The documents listed in the attachment at the end of this report were also used by the inspectors to evaluate this area.

b. Findings

No new findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11)

a. Inspection Scope

On February 19, 2003, the inspectors observed an operating crew during an “out-of-the-box” requalification examination on the simulator using Scenario “Cycle 03-00B” 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 1;
- 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.

In addition, the documents listed in the attachment at the end of this report were also used by the inspectors to evaluate this area.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

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 system:

- CV-2, high head safety injection including recirculation phase.

During this inspection, the inspectors evaluated the licensee's monitoring and trending of performance data for the past two years, 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 maintenance rule scoping and report documents listed in the attachment at the end of this report. For each system, structure, and component reviewed, the inspectors also reviewed the significant work orders and condition reports listed in the attachment at the end of 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 assessed the adequacy of the technician's work practices during the recent troubleshooting of the 2A charging pump following the identification of excessive vibrations and the subsequent repair effort.

The documents listed in the attachment at the end of this report were also used by the inspectors to evaluate this area.

b. Findings

A Green finding was identified through a self-revealing event when technicians failed to apply gasket sealant to the inboard and outboard bearing lube oil housings gaskets during the reassembly of the Unit 2 train A charging pump. This led to excessive oil leakage, and required the pump to be removed from service for repair. The finding was not considered a violation of regulatory requirements.

Description

On March 3, 2003, after completing a post maintenance test following replacement of the rotating element, the Unit 2 train A charging pump was returned to service. On March 7 and March 8, 2003, operators noted that indicated oil level for the pump was low, and added oil to the pump. Subsequently, operators generated a condition report on the issue and looked for oil leaks on the pump, but none were identified. During the first shift on March 9, 2003, a field supervisor identified an oil leak, and later that shift

the licensee decided to remove the pump from service to repair the leak. Technicians repaired the leak and returned the pump to service later in the day on March 9, 2003.

Subsequently, the inspectors reviewed the associated condition reports and interviewed operations, engineering and maintenance personnel. The inspectors determined that during the assembly of the pump on March 2, 2003, the technicians failed to apply gasket sealant to the inboard and outboard bearing and lubricating oil housing gaskets. This resulted in the lube oil leak that was later identified on March 9, 2003. Application of gasket sealant is considered skill of the craft and therefore is not required to be placed into licensee procedures. A skill of the craft is something that is considered common knowledge for individuals trained to perform this type of maintenance work.

### Analysis

The inspectors determined that the failure to apply gasket sealant to the inboard and outboard bearing lube oil housings gaskets during the reassembly of the 2A charging pump, which resulted in a significant oil leak and additional pump unavailability time to repair, 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 the finding was more than minor since the pump was returned to service with a deficiency which later required the pump to be removed from service. This is similar to the more than minor examples of Section 5 of Appendix E of IMC 0612. The inspectors determined that this deficiency affected the cross-cutting area of Human Performance since proper gasket installation is a skill of the craft activity.

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 the operability, availability and reliability of a train of a mitigating system. For the Phase 1 screening, the inspectors answered "no" to all the questions in the Mitigating System column, because there was no design deficiency, no actual loss of safety function, no single train loss of safety function for greater than the Technical Specification (TS) allowed outage time, and no risk due to external events. Therefore, the finding was of very low safety significance (Green) (FIN 50-455/03-02-01).

### Enforcement

The inspectors determined that, since no procedure is required for gasket installation per Paragraph 9.a of Appendix A of Regulatory Guide 1.33, no violation of regulatory requirements occurred. The licensee entered the problem into its corrective action system as Condition Report 00148194, "2A CV [Charging System] Pump Oil Leakage," dated March 9, 2003.

## 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 at the end of 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 work associated with the Unit 0 essential service water cooling tower fan B and emergent work associated with the Unit 0 station air compressor on February 5, 2003;
- Simultaneous planned outages of Unit 1 containment spray system train B and the Unit 1C steam dump valve, and emergent work associated with the Unit 0 station air compressor on February 6, 2003;
- Emergent work associated with the essential service water cooling tower fan 0B on February 18, 2003;
- Emergent work associated with the unplanned work identified during a planned work window on the Unit 1 reactor containment fan cooler train A on February 25, 2003;
- Emergent work associated with the Unit 2 charging system train B on March 9, 2003; and
- Simultaneous planned work associated with the Unit 0 component cooling water heat exchanger and the Unit 1G steam dump valve on March 24, 2003.

The documents listed in the attachment at the end of this report were also used by the inspectors to evaluate this area.

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 evolution:

- Unit 1 load increase using the normal dilution flowpath on March 2, 2003.

The inspectors evaluated crew performance in the areas of:

- Clarity and formality of communications;
- 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 1;
- 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 documents listed in the attachment at the end of this report were also used by the inspectors to evaluate this area.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors evaluated plant conditions, selected condition reports 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:

- Operability Determination 01-012, essential service water cooling tower leakage;
- Engineering Evaluation 341404; in support of Condition Report 146475: 2A diesel generator slow start and Condition Report 147003: 2A diesel generator tripped during post maintenance test;
- Condition Report 148163, 2A centrifugal charging pump oil leak; and
- Clearance Order 00018037, replacement of flow controller for damper 22YA and 22YB.

The inspectors compared the operability and design criteria in the appropriate section of the 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 documents listed in the attachment at the end of this report were also used by the inspectors to evaluate this area.

b. Findings

The inspectors identified a Green finding regarding the licensee's failure to appropriately assess the operability of the nonaccessible area exhaust filter plenum ventilation system during a work activity to repair the discharge flow control damper for the 0A VA nonaccessible filter plenum exhaust fan. This finding was not considered a violation of regulatory requirements.

System Background

The nonaccessible area exhaust filter plenum ventilation system, consists of three plenums that filter air from the area of the active emergency core cooling system (ECCS) components during the recirculation phase of a Loss of Coolant Accident (LOCA). During a large break LOCA, and a passive failure of the ECCS outside containment, the nonaccessible area exhaust filter plenum ventilation system is designed to limit the radioactive release within the 10 CFR 100 limits.

Description

On March 19, 2003, at 6:01 p.m., the licensee implemented Clearance Order 00018037 for portions of train A of the nonaccessible area exhaust filter plenum ventilation system to support the replacement of the flow controller for discharge damper 0VA22Y. A clearance order is the licensee's process for controlling configuration during maintenance and other related activities to protect personnel and equipment. Part of the clearance order resulted in failing open the inlet damper for train A of the nonaccessible area exhaust filter plenum ventilation system. Based on the clearance order, operator actions outside the control room would be required to remove the clearance order and allow for repositioning the inlet damper. The inspectors noted the system configuration and questioned the shift manager regarding the operability of train A of the nonaccessible area exhaust filter plenum ventilation system. The shift manager considered the plenum operable because, with the inlet damper failed open, the plenum was still lined up for operations. Upon completion of the work activity on March 20, the clearance order was removed and remote control of the train A inlet damper was restored.

After additional review of the system design basis and discussions with the licensee, the inspectors determined that train A of the nonaccessible area exhaust filter plenum ventilation system was inoperable in the condition with the inlet damper failed open. Specifically, TS 3.7.12 required that three trains of the nonaccessible area exhaust filter plenum ventilation system be operable, with two trains aligned for operations and one

train aligned for standby. The TS Basis section stated that the operability of the dampers is needed for the associated train to be considered operable. In addition, the TS Basis section described that, in order for the nonaccessible area exhaust filter plenum ventilation system to perform its function, filtration and motive force must be provided by two of the three trains and bypass path(s) to the normal auxiliary building exhaust system must be isolated and the third train's inlet damper must be closed. The closure of the third train's inlet damper ensured filtration of the exhaust from the ECCS pump rooms by eliminating the potential bypass flow. The TS Basis section also described that if the standby train is needed, it can be placed in service from the control room. Furthermore, licensee's procedure, BOP VA-5, "Auxiliary Building Charcoal Booster Fan Operation," Revision 6, required the operators to secure an operating train of the system, which included closing the inlet damper, prior to bringing the standby train online. This procedure would have been used if the operators needed to start the standby train during an accident. Based on the above, the inspectors concluded that the nonaccessible area exhaust filter plenum train A was inoperable while the inlet damper was failed open.

### Analysis

The inspectors determined that the failure to adequately evaluate the operability of the nonaccessible area exhaust filter plenum ventilation system 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 the finding was more than minor because, the condition, if left uncorrected would become a more significant safety concern, in that it would impact the operators' ability to combat an accident and minimize offsite exposure for certain accidents. The inspectors determined that the inadequate operability determination also affected the cross-cutting area of Human Performance, because the licensee initiated the work on the nonaccessible area exhaust filter plenum without adequately assessing the impact on system operability.

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 the operability and reliability of a barrier integrity system. For the Phase 1 screening, the inspectors answered "yes" to question 1 in the Containment Barrier column, because the finding only represented a degradation of the radiological barrier function provided for the auxiliary building. Therefore, the finding was of very low safety significance (Green) (FIN 50-455/03-02-02).

### Enforcement

The inspectors determined that since train A of the nonaccessible area exhaust filter plenum ventilation system was inoperable for less than the 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 Condition Report 00150058, "Questioned VA system operability with Clearance Order 00018037," dated March 20, 2003.

1R16 Operator Workarounds (71111.16)

a. Inspection Scope

The inspectors reviewed the following operator challenge:

- Operator Workaround 273, action required to prevent residual heat removal pump seizure.

The inspectors interviewed operating and engineering department personnel and reviewed the licensee's changes taken to address the concerns with the residual heat removal pump.

b. Findings

No findings of significance were identified.

1R17 Permanent Modifications (71111.17A)

a. Inspection Scope

The inspectors evaluated the following permanent plant modification:

- Engineering Change 338614; replace hand switch operator with different style, completed on March 24, 2003.

The inspectors reviewed the modification installed in March 2003 to verify that the design basis, licensing basis, and performance capability of risk significant systems were not degraded by the installation of the modification. The inspectors considered the design adequacy of the modification by performing a review of the modification's impact on plant electrical requirements, material requirements and replacement components, response time, control signals, equipment protection, operation, failure modes, and other related process requirements.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the post maintenance testing activities associated with maintenance or modification of mitigating, barrier integrity, and support systems that were identified as risk significant in the licensee's risk analysis. The inspectors reviewed these activities to 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 interviewed maintenance 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 at the end of this report, to evaluate this area.

Testing subsequent to the following activities was observed and evaluated:

- Unit 1 train B essential service water pump and valve maintenance on January 15, 2003;
- Unit 1 train A charging pump maintenance on January 31, 2003;
- Unit 2 train A charging pump following the replacement of the rotating element on March 2, 2003;
- Unit 2 train A emergency diesel generator following the replacement of the mechanical governor on March 2, 2003; and
- Unit 2 train A residual heat removal pump bypass valve control switch replacement on March 24, 2003.

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 using the surveillance procedures 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 at the end of 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 2 charging pump train B ASME [American Society of Mechanical Engineers] surveillance test on January 13, 2003;
- Unit 1 essential service water pump train B ASME surveillance test on January 15, 2003;
- Unit 2 emergency diesel generator B 18-monthly surveillance on January 15, 2003;
- Unit 1 component cooling water pump train A ASME surveillance on February 25, 2003; and
- Unit 0 component cooling water pump discharge check valve back flow test on February 25, 2003.

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 341136, temporary removal of resistance temperature detector OTE-SX176B for train 0B essential service water make-up pump.

The inspectors reviewed this temporary plant modification to verify that the instructions were consistent with applicable design modification documents and that the modification did not adversely impact system operability or availability. The inspectors interviewed operations, engineering and maintenance 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 at the end of 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 February 25, 2003. 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.

b. Findings

No findings of significance were identified.

## 2. RADIATION SAFETY

### Cornerstone: Occupational Radiation Safety

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

##### .1 Plant Walkdowns and Radiological Boundary Verification

###### a. Inspection Scope

The inspectors conducted walkdowns of the radiologically controlled area to verify the adequacy of radiological boundaries and postings. Specifically, the inspectors walked down several radiation and high radiation area boundaries in the auxiliary and radwaste buildings. Confirmatory radiation measurements were taken to verify that these areas were properly posted and controlled in accordance with 10 CFR Part 20, licensee procedures and TS. The radiation work permit (RWP) for routine surveillances/inspections/tests was reviewed for electronic dosimeter alarm set points and protective clothing requirements.

###### b. Findings

No findings of significance were identified.

##### .2 Job-in-Progress Reviews

###### a. Inspection Scope

The inspectors observed the following high radiation area work activity and evaluated the licensee's use of radiological controls:

- Unit 2 containment entry (at 100% power) - remote operated vehicle entry inside containment missile barrier. (January 16, 2003)

The inspectors reviewed radiological job requirements for the activity, attended the pre-job briefing, and observed job performance with respect to those requirements. The inspectors reviewed required surveys and radiation protection (RP) job coverage, including contamination controls, to verify that appropriate radiological controls were utilized and consistent with the RWP. The inspectors observed RP technician and worker performance to determine if the technicians and workers were aware of the radiological conditions in their workplace, the RWP controls/limits in place and to verify that the individuals performed adequately given the level of radiological hazards present.

###### b. Findings

No findings of significance were identified.

.3 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed condition reports completed in recent months that focused on access control to radiologically significant areas. The inspectors reviewed these documents to assess the licensee's ability to identify repetitive problems, contributing causes, the extent of conditions, and implement corrective actions intended to achieve lasting results.

b. Findings

No findings of significance were identified.

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

.1 Post-B2R10 Outage ALARA Reviews

a. Inspection Scope

The inspectors reviewed B2R10 Outage RWP Work-In-Progress Reviews to compare the results achieved with the dose estimates established in the licensee's ALARA plans for these work activities. Included in this review, the inspectors assessed the potential reasons (e.g., failure to adequately plan the activity, failure to provide sufficient work/engineering controls, etc.) for any inconsistencies between estimated and actual work activity doses. The inspectors also reviewed B2R10 RP/ALARA-related condition reports to assess the licensee's ability to identify repetitive problems, contributing causes, and the extent of conditions, and implement corrective actions intended to achieve lasting results for future refueling outages.

b. Findings

No findings of significance were identified.

2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03)

.1 Tests and Calibrations of Radiation Monitoring Instrumentation

a. Inspection Scope

The inspectors reviewed calibration and surveillance records for radiological instrumentation associated with monitoring transient high and/or very high radiation areas and instruments used for remote emergency assessment, to verify the calibrations were conducted consistent with industry standards and in accordance with licensee procedures. The inspectors reviewed the UFSAR and performed walkdowns to confirm that selected area radiation monitors (ARMs) were located as described. The inspectors reviewed the licensee's alarm set points for selected ARMs to verify that the set points were established consistent with the UFSAR, TS, and Emergency Plan requirements. Specifically, the inspectors selectively reviewed calibration procedures, calendar years

2001 - 2002 calibration records, and discussed the overall system health with the cognizant system engineer for the following radiation monitoring instrumentation:

- Units 1 and 2 high range containment ARMs (2RE-AR020 and 1RE-AR021);
- Units 1 and 2 containment fuel handling incident ARMs (1RE-AR012 and 2RE-AR011);
- Unit 2 piping penetration ARM (2RE-AR025A);
- Volume reduction area ARM (0RE-AR047); and
- Unit 1 main steam line ARM (1RE-AR022D).

The inspectors discussed surveillance practices and reviewed calendar years 2001 - 2002 calibration records and procedures for selected radiation monitors used for assessment of internal exposure, and those instruments utilized for surveys of personnel and equipment prior to egress from controlled areas of the station. The inspectors observed RP staff complete functional tests of selected personnel contamination monitors and small articles monitors at the 401' elevation auxiliary building radiologically controlled area egress point, to confirm that these instruments were source tested and calibrated adequately in accordance with licensee procedures and industry standards. These instruments included:

- Canberra FastScan whole body counting systems;
- Eberline PM-7 portal monitors;
- NE Technology IPM-7/8 whole body frisking monitors; and
- NE Technology small articles monitors.

The inspectors also reviewed the operations of the licensee's calibration facility and verified that those radiation survey instruments staged "ready for use" had current calibrations, were operable, and in good physical condition. Additionally, the inspectors reviewed the most recent calibration documentation for selected "ready for use" instruments staged in the calibration facility and the instrumentation used by the RP technicians during their coverage of the work described in Section 2OS1.2. The inspectors observed RP staff source check a selection of portable radiation survey instruments to confirm that those tests were completed adequately using appropriate radiation sources and in accordance with licensee procedures.

b. Findings

No findings of significance were identified.

.2 Radiation Protection Technician Instrument Use

a. Inspection Scope

The inspectors observed the selection and use of radiation survey instrumentation by RP technicians during their job coverage of the Unit 2 containment entry (described in Section 2OS1.2). Specifically, the inspectors assessed the appropriateness of the instruments selected for the job coverage given the radiological conditions anticipated (i.e., gamma and neutron radiation fields) and observed the RP technicians self-check the instrumentation for operability prior to use.

b. Findings

No findings of significance were identified.

.3 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed: (1) the results of a focus area self-assessment of the radiation monitoring instrumentation program completed by the RP staff in December 2002; and (2) condition reports related to the radiation monitoring instrumentation program generated in calendar years 2001-2003. The inspectors reviewed these documents to assess the licensee's ability to identify repetitive problems, contributing causes, the extent of conditions, and implement corrective actions intended to achieve lasting results.

b. Findings

No findings of significance were identified.

4OA2 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 findings of significance were identified.

.2 Detailed Review - Evaluation of Unit 1 Thermal Power Limits

Introduction

In Condition Report 91771, "Unexplained Differences Between Byron and Braidwood," the licensee identified that numerous plant parameters were indicating higher on Byron Unit 1 than the similarly designed Braidwood Unit 1. The differences were first noted following the implementation of the AMAG (Advanced Measurement and Analysis Group) ultrasonic feedwater flow measuring instruments. The AMAG ultrasonic feedwater flow measuring instruments were more accurate than the other installed feedwater flow instruments. Since feedwater mass flowrate is a significant parameter

used in determining reactor thermal power, the installation of the AMAG ultrasonic feedwater flow measuring instruments meant the licensee could more accurately determine reactor power. This allowed the licensee to eliminate instrument tolerance losses associated with the old feedwater flow instruments, and therefore increase production while maintaining adequate assurance that they were below their licensed thermal power limits. The condition report noted that many plant parameters, other than those provided by the AMAG ultrasonic feedwater flow measuring instruments, were indicating that Byron Unit 1 was possibly operating at a power higher than their licensed thermal power limit. Because of potential that Byron Unit 1 could be operating at a power greater than their licensed thermal power limit, the inspectors reviewed the licensee's apparent cause evaluation associated with this condition report.

a. Prioritization and Evaluation of Issues

(1) Inspection Scope

The inspectors reviewed the apparent cause evaluation associated with Condition Report 91771 to assess the adequacy of the licensee's evaluation, and verify that the licensee was operating within their thermal power limits.

(2) Issues

The inspectors reviewed the apparent cause evaluation associated with Condition Report 91711, "Unexplained Differences Between Byron and Braidwood." The licensee's evaluation included reviews of:

- Plant design and calculations, including changes associated with power uprate;
- AMAG ultrasonic flow instrument installation, calibration and performance;
- Fuel burn-up rate;
- Primary and secondary plant parameters and calorimetrics.

Part of the licensee's evaluation was an independent assessment of the issues completed by Exelon engineers from their Mid-Atlantic Regional Operating Group. Based on the evaluation, the licensee identified no problems indicating that they were operating Byron Unit 1 in excess of their licensed thermal power limit. Furthermore, the licensee concluded that the difference between Byron and Braidwood was most likely linked to the AMAG ultrasonic flow instrument. However, their review failed to identify an apparent cause. Therefore, the licensee created corrective actions to review the plant performance following each of the next operating cycles.

The inspectors considered the licensee's evaluation to be of appropriate scope and depth. However, based on the potential for Byron Unit 1 to be exceeding the licensed thermal power limit, and the technical complexity of the issue, the inspectors generated a task interface agreement with the Office of Nuclear Reactor Regulation (NRR) for additional review. This resulted in correspondence between NRR and the licensee, and a meeting between the two organizations on January 24, 2003, to discuss the Byron Unit 1 thermal power issues. NRR's review of this issue was still ongoing as of the close of this inspection period. Therefore, this issue is an Unresolved Item (50-454/03-02-03) pending the completion of NRR's review.

#### 4OA4 Cross-Cutting Findings

- .1 A finding described in Section 1R12 of this report had, as its primary cause, a human performance deficiency, in that technicians failed to apply a gasket sealant to the inboard and outboard bearing lube oil housings gaskets during the reassembly of the 2A centrifugal charging pump following the replacement of the rotating element. This resulted in excessive oil leakage and additional unavailability time of the pump to complete repairs. Proper gasket installation is a skill of the craft activity.
- .2 A finding described in Section 1R15 of this report had, as its primary cause, a human performance deficiency, in that the licensee failed to recognize that a work activity associated filter plenum exhaust system train A, resulted in the train being inoperable.

#### 4OA6 Meetings

##### .1 Exit Meeting

The inspectors presented the inspection results to Mr. Rich Lopriore and other members of licensee management at the conclusion of the inspection on April 4, 2003. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

##### .2 Interim Exit Meetings

An interim exit was conducted for:

- Radiation Protection inspection with Mr. R. Lopriore on January 17, 2003.

**SUPPLEMENTAL INFORMATION**

**KEY POINTS OF CONTACT**

Licensee

R. Lopriore, Site Vice President  
S. Kuczynski, Plant Manager  
B. Adams, Engineering Director  
D. Combs, Site Security Manager  
D. Goldsmith, Radiation Protection Director  
B. Grundmann, Regulatory Assurance Manager  
D. Hoots, Maintenance Manager  
W. Kolo, Work Management Director  
S. Leach, Radiation Protection Instrument Coordinator  
S. Stimac, Operations Manager

Nuclear Regulatory Commission

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

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-455/03-02-01	FIN	Failure to apply gasket sealant during the reassembly of the 2A CV pump
50-454/455/03-02-02	FIN	Failure to adequately evaluate the operability of the nonaccessible area exhaust filter plenum ventilation system during a work activity
50-454/03-02-03	URI	Evaluation for Unit 1 potentially exceeding licensed thermal power limits

Closed

50-455/03-02-01	FIN	Failure to apply gasket sealant during the reassembly of the 2A CV pump
50-454/455/03-02-02	FIN	Failure to adequately evaluate the operability of the nonaccessible area exhaust filter plenum ventilation system during a work activity

Discussed

None

## LIST OF DOCUMENTS REVIEWED

### 1R04 Equipment Alignment

Condition Report (CR) 137005; As Found Acceptance Criteria for 2SX01AB Was Not Met, November 06, 2002,  
CR 139746; As Found Condition of 1B essential service water (SX) Pump Lube Oil Cooler (1SX01AB), January 16, 2003,  
CR 141451; As Found Condition of 2A SX Pump Lube Oil Cooler (2SX01AA), January 28, 2003,  
CR 142184; 1A CV Pump Oil Cooler SX Outlet Isolation Valve, January 31, 2003,  
CR 145070; 1A Diesel Generator (DG) Jacket Water Heat Exchanger Corrosion, February 18, 2003,  
CR 145297; Air Operated Valve 1SX169A Air Supply Piping May Be Restricting Air Flow, February 19, 2003,  
CR 145550; Cooldown Trip Received at End of Post Maintenance DG Run, February 20, 2003,  
CR 145551; One of Two DG Overspeed Trip Relays Did Not Energize, February 19, 2003,  
BOP CS-E1A; Unit 1 Containment Spray System Train "A" Electrical Lineup, Revision 1,  
BOP CS-M1A; Containment Spray System Train "A" Valve Lineup, Revision 1,  
BOP DG-M1B; Train "B" Diesel Generator System Valve Lineup, Revision 9,  
BOP DG-1; Diesel Generator Alignment to Standby Condition, Revision 9,  
BOP DG-21; Diesel Generator Air Receiver Pressure Control, Revision 3,  
BOP DG-E1B; Unit 1 Diesel Generator Train "B" Electrical Lineup, Revision 2,  
BOP CV-E1B; Chemical and Volume Control Train "B", Unit 1, Electrical Lineup, Revision 1,  
BOP CV-M1B; Unit 1 Chemical and Volume Control System Train "B" Valve Lineup, Revision 5,  
BOP SX-E2B; Unit 2 Essential Service Water Train "B" Electrical Lineup, Revision 1,  
BOP SX-M2B; Unit 2 Essential Service Water Train "B" Valve Lineup, Revision 6,  
Work Request (WR) 52655; Filter Housing Leaks Air at Bottom, February 20, 2003

### 1R05 Fire Protection

Byron/Braidwood Stations Fire Protection Report; Amendment 20,  
BAP 1100-7; Fire Prevention for Transient Combustibles, Revision 10,  
BAP 1100-7A1; Minor Transient Combustibles, Revision 1,  
BAP 1100-9; Control, Use, and Storage of Flammable and Combustible Liquids and Aerosols, Revision 6,  
OBVSR 10.g.6-1; Fire Barrier Penetration Visual Inspection 18 Month Surveillance, Revision 4,  
OBVSR 10.g.8-1; Fire Rated Assemblies Visual Inspection, Revision 2,  
WR 83863; NRC Identified Floor Drain in Unit 2 Upper Cable Spreading Room Missing Grate, February 5, 2003,<sup>1</sup>  
50.59 Review; Disable CO2 Suppression System in the Upper Cable Spreading Rooms, Revision 0,  
CR 151793; NRC Plant Walkdown Comments, March 31, 2003,<sup>1</sup>

CR 148385; Miscellaneous Housekeeping Issues, March 10, 2003, <sup>1</sup>  
CR 148330; Holes in South Wall of Unit 1 Auxiliary Electrical Room, March 10, 2003,  
CR 148945; Small Hole in AEER Wall Leads to LCOAR Entry, March 13, 2003, <sup>1</sup>  
CR 148903; Fires Seals in Unit 1 Auxiliary Electrical Room, March 13, 2003, <sup>1</sup>  
CR 150258; NRC Auxiliary Building Housekeeping Items, March 21, 2003 <sup>1</sup>  
CR 151059; Fire Protection Report Error: Quantification of Lube Oil, March 17, 2003, <sup>1</sup>  
Engineering Change 339805; Fire Door Acceptance Criteria, Revision 0  
Engineering Change 341913; Unit ½ AEER [Auxiliary Electrical Equipment Room] Fire  
Rated Wall Imperfections at Toggle Bolt Attachment  
Sargent & Lundy Drawing Number 6E-0-3391A; Electrical Installation Grounding Details,  
Revision AB

#### 1R07 Heat Sink Performance

Work Order (WO) 991 6575-01; Perform Various Preventive Maintenance Activities on  
1CV01PA,  
WO 00383996-01; Clean and Inspect Lube Oil Cooler 2SX01AA,  
BMP 3222-1; Preventive Maintenance of Essential Service Water Pump Oil Cooler,  
NSP ER-AA-340-1002; Service Water Heat Exchanger and Component Inspection  
Guide, Revision 0

#### 1R11 Licensed Operator Requalification Program

CR 145591; Licensed Operator Requalification Training Cycle 2003-01 Observation,  
February 21, 2003,  
CR 146472; Licensed Operator Requalification Training Identified Issues, February 26,  
2003,  
Requalification Simulator Scenario Guide No. 03-1-00B Revision 0, February 19, 2003,  
NSP EP-AA-1002; Radiological Emergency Plan Annex for Byron Station, Revision  
CR 153201; Discretionary EAL Determination for Manual SI, April 9, 2003 <sup>1</sup>

#### 1R12 Maintenance Effectiveness

CR 118069; Unit 2 Seal Injection, August 02, 2002,  
CR 120061; 2B CV Filter Broken Alignment Plate, August 20, 2002,  
CR 134932; Installation of Engineering Change 79820 on 1B CV Pump, December 10,  
2002,  
CR 137891; CV Diaphragm Valves Internally Damaged, December 31, 2002,  
CR 138066; Improper Exhaust Tube on Solenoid, January 03, 2003,  
CR 143285; Corrective Maintenance Not Performed, February 05, 2003,  
CR 144367; 2PT-0150 Was Found Out-of-Tolerance, February 12, 2003,  
CR 144416; Instruments being Overranged, February 12, 2003,  
CR 146165; High Vibration 2A CV Pump During ASME Surveillance, February 25, 2003,  
CR 146479; Letdown Flow, February 26, 2003,  
CR 146611; Leakby of 1CV8223A, 1A CV Mixed Bed Resin Fill Isolation Valve,  
February 14, 2003,  
CR 146719; Spare Rotating Element Purchase Order Non Conformance, February 28,  
2003,

CR 146722; P.O. Non Conformance Spare CV Pump Shaft Sleeves, February 28, 2003,  
CR 146729; Spare CV Pump Thrust Bearing Procurement, February 28, 2003,  
CR 147092; Proximity Probe Brackets for 2CV02PA Did Not Fit, March 04, 2003,  
CR 148163; 2A CV Pump Oil Level, March 08, 2003,  
CR 148194; 2A CV Pump Oil Leakage, March 09, 2003,  
CR 148211; 2A CV Pump Oil Loss Evaluation and Notification Timeliness, March 09,  
2003,  
CR 149843; Installation of Rotary Geared Lube Oil Pump for 1CV01PA, March 19,  
2003,  
CR 150209; Oil Sample: 1B CV Pump Motor Inboard Bearing Viscosity High, March 05,  
2003,  
CR 150221; 1A CV Pump Seal Leakage, March 21, 2003,  
CR 152110; Procedure Enhancement Needed/Paper Closeout Issue, March 31, 2003,  
Engineering Change 341449; 2A CV Pump Temporary Proximity Probes and Optical  
Pickup,  
Engineering Change 341466; Evaluation of Potential for Foreign Material Intrusion into  
Byron Unit 2 Reactor Coolant System Due to 2A CV Pump Sleeve Failure, Revision 0,  
Maintenance Rule - Performance Criteria; High Head Safety Injection, Including  
Recirculation Phase, March 19, 2003,  
Maintenance Rule - Evaluation History, March 13, 2003,  
Maintenance Rule - Performance Monitoring, March 19, 2003,  
Memo - Maintenance Rule Status of CV System, February 27, 2003,  
2BVSr 5.2.4-5; Unit 2 - Train A ASME Surveillance Requirements for Centrifugal  
Charging Pump 2A and Chemical and Volume Control System Valve Stroke Test,  
Revision 6,  
50.59 Review; Evaluation of Foreign Material Intrusion into Byron Unit 2 Due to 2A  
CV Pump Sleeve Failure, Revision 0,  
Memo; Failure Analysis of the 2B Charging Pump Shaft from Byron Station Flowserve  
(Pacific Pumps), Model RLIJ 11 Stage, March 24, 2003,  
CV Pump Internals Drawing E-49766,  
WO 369652; 1A CV Breaker Prevent Maintenance Bus 141 CUB 11, December 17,  
2002,  
WO 471174; Increasing Motor Vibrations - Check/Re-align Motor, December 26, 2003,  
WO 504401; ASME Surveillance Requirements for Centrifugal Charging Pump,  
January 02, 2003,  
WO 512755; ASME Surveillance Requirements for 2A CV Pump, March 02, 2003,  
WO 547558; Perform 2A CV ASME, March 02, 2003,  
Engineering Change 338323; 2CV8369A/D Throttle Position and Impact of FME on  
SSC's Downstream of 2CV8369A/D for CR 118069,  
What-If Data Chart; Safety System Unavailability - High Pressure Injection System,  
Industry Information Regarding Charging Pump Failures, February 24, 1994,  
2BVSr 4.f.2-11; Unit 2 NonRoutine Visual Examination (VT-2) of ASME Class 1, 2 and  
3 Components at Nominal Operating Pressures, Revision 3,  
NSP HU-AA-104-101; Procedure Use and Adherence, Revision 0,  
Training Plan MC20109: Gasket Fabrication, Revision 1

1R13 Maintenance Risk Assessments And Emergent Work Control

Byron Operating Department Policy #400-47; April 7, 2001, Revision 2,  
CR 145544; 0B SX Fan Fails Post Maintenance Test, Oil Pressure Low Alarm Still Lit,  
February 20, 2003,  
NSP ER-AA-600; Risk Management, Revision 2,  
NSP ER-AA-600-1042; On-line Risk Management, Revision 1,  
NSP ER-AA-310; Implementation of the Maintenance Rule, Revision 2,  
NSP WC-AA-101; On-line Work Control Process, Revision 6

1R14 Personnel Performance During Non-Routine Evolutions

CR 146479; Letdown Flow, February 26, 2003,  
Operator Narrative Log, March 02, 2003,  
1BGP 100-3T5; Load Change Instruction Sheet for Power Increases <15% in 1 Hour,  
Revision 7

1R15 Operability Evaluations

Technical Specifications,  
Technical Specification Basis,  
Technical Requirement Manual,  
Updated Final Safety Analysis Report,  
NRC Inspection Manual Part 9900: Technical Guidance; Operable/Operability:  
Ensuring the Functional Capability of a System or Component,  
NRC Inspection Manual Part 9900: Technical Guidance; Resolution of Degraded and  
Nonconforming Conditions, October 8, 1997,  
NRC Generic Letter No 91-18, Revision 1; Information to Licensees Regarding NRC  
Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions,  
NRC Inspection Manual Part 9900: Technical Guidance; Maintenance - Preconditioning  
of Structures, Systems, and Components Before Determining Operability,  
CR 146604; Breakdown in NRC Resident Notification, February 26, 2003,  
CR 146475; 2A DG Slow Start, February 26, 2003,  
CR 147003; 2A DG Tripped During Post Maintenance Testing/BOSR, March 01, 2003,  
CR 148211; 2A CV Pump Oil Loss Evaluation and Notification Timeliness, March 09,  
2003,  
CR 56877; B2001-03033 Large Amount of Water on Ground and Roadway Near SX  
Cooling Tower, December 31, 2001,  
CR 147052; BMP 3108-12, Requires Clarification for "HU" Improvement, March 02,  
2003,  
CR 148163; 2A CV Pump Oil Level, March 08, 2003,  
CR 148194; 2A CV Pump Oil Leakage, March 09, 2003,  
CR 150058; Questioned VA System Operability with Clearance Order 18037,  
March 20, 2003,<sup>1</sup>  
0BOSR Z.7.a.2-1; Unit Common Deepwell Pump Operability Monthly Surveillance,  
Revision 3,  
Design Analysis No. NED-M-MSD-014; Byron Ultimate Heat Sink Cooling Tower Basin  
Makeup Calculation, Revision 8,

NSP LS-AA-105-1001; OB ESWCT Basin Leaking, Revision 2,  
Engineering Change Evaluation No. 34104; Support of CR 146475 - 2A Diesel  
Generator Slow Start & CR 147003 - 2A Diesel Generator Tripped During Post  
Maintenance Testing/BOSR, Revision 0,  
Operations Narrative Logs, March 07, 2003 to March 09, 2003,  
Operations Narrative Logs, March 19, 2003,  
1BEP-0; Unit 1 Reactor Trip or Safety Injection, Revision 102,  
BOP VA-5; Auxiliary Building Charcoal Booster Fan Operation, Revision 6,  
OBOL 7.12; Nonaccessible Area Exhaust Filter Plenum Ventilation System, Revision 3,  
WO 517162; Damper Controlling Flow Too Low, March 19, 2003,  
WO 547542; Troubleshoot To Locate Source of Unexpected Voltage, March 26, 2003,  
Clearance Order 18037; Auxiliary Building Damper 22YA and 22YB Flow Indicator  
Controller, March 20, 2003,  
Plant Drawing M-95 Sheet 11; Diagram of Auxiliary Building HVAC System - VA,  
Revision M,  
System Design Description SDD-VA-01-BB; Auxiliary Building HVAC System Design  
Description, Revision 0

1R16 Operator Workarounds

Operator Workaround 273; EMD Modify 2RH610 (2A Train) installed, March 25, 2003

1R17 Permanent Plant Modifications

Engineering Change 338614; Revise Control Switch (2RH610) to Maintained Open  
Contact, January 13, 2003

1R19 Post Maintenance Testing

Technical Specifications,  
Technical Requirement Manual,  
Updated Final Safety Analysis Report,  
1BVSR 5.2.4.5; Unit 1 Train "A" ASME Surveillance Requirements for Centrifugal  
Charging Pump 1A and Chemical Volume Control System Valve Stroke Test,  
Revision 6,  
BOP CV-3; Filling and Venting the CV System, Revision 14,  
CR 146475; 2A DG Slow Start, February 26, 2003,  
CR 146165; High Vibration 2A CV Pump During ASME Surveillance, February 25, 2003,  
CR 146719; Spare Rotating Element Purchase Order. Non Conformance, February 28,  
2003,  
CR 146722; P.O. Non Conformance Spare CV Pump Shaft Sleeves, February 28, 2003,  
CR 146729; Spare CV Pump Thrust Bearing Procurement, February 28, 2003,  
CR 147003; 2A DG Tripped During Post Maintenance Testing/BOSR, March 02, 2003,  
CR 147052; BMP 3108-12, Requires Clarification for "HU" Improvement, March 02,  
2003,  
CR 147065; NRC Concern, Procedure Inadequacies/In Complete CV Pump Vent,  
March 02, 2003,<sup>1</sup>  
CR 147092; Proximity Probe Brackets for 2CV02PA Did Not Fit, March 04, 2003,

CR 148163; 2A CV Pump Oil Level, March 08, 2003,  
CR 148194; 2A CV Pump Oil Leakage, March 09, 2003,  
CR 148211; 2A CV Pump Oil Loss Evaluation and Notification Timeliness, March 09, 2003,  
Outage Work Schedule, 1B SX System, January 15, 2003,  
WO 00343614; Operations Maintenance Testing - Visual, January 15, 2003,  
WO 445980; Operations Post Maintenance Testing - Visual For Temps and Leakage, January 15, 2003,  
WO 471188; Oil Pressure Jumping Between 11.5 & 13 psig on 1PI-SX152, December 20, 2002,  
WO 498108; 1BOSR 0.5-2.SX.1-2, Manual Stroke Test of 1SX150B, January 16, 2003,  
WO 99261578; Operations Post Maintenance Testing - Stroke, January 15, 2003,  
WO 99261578 03; SEP Post Maintenance Testing - VT2 (4 hour hold time), January 15, 2003,  
WO 512755; ASME Surveillance Requirements for 2A CV Pump, March 02, 2003,  
WO 547497; SI Pump ECCS Flow Balance Test (after system alteration), March 02, 2003,  
WO 547558; SEP-Performance Data Collection 2A CV Pump,  
WO 548606; Operations Post Maintenance Testing - Emergency Start, March 01, 2003,  
WO 548232; Replace Pneumatic/Control Valves, March 01, 2003,  
WO 548232; Operations Post Maintenance Testing Engine Run, March 01, 2003,  
WO 548217; 2A Diesel Generator Slow Start, March 03, 2003,  
WO 548606 02; Perform Mechanical Governor Set-up, March 01, 2003,  
WO 548606; Check Fuel Linkage for Free Movement, March 03, 2003,  
WO 548245; Replace Pneumatic/Control Valves, March 01, 2003,  
Operations Narrative Logs; February 27, 2003,  
1BOSR 0.5-2.SX.1-2; Unit 1 Manual Stroke Test of 1SX150B, Revision 2,  
Characteristic Curve Centrifugal Pump, March 22, 1977,  
BAP 500-4T1 Qualifications Matrix; CS1 2120 Vibration Meter, December 15, 2002,  
NSP MA-AA-716-100; 2A Diesel Generator Mechanical Governor Setup Test, Revision 1,  
Woodward Vendor Manual 82340C; EGB-Proportional Governor/Actuator with Hydraulic Amplifier Systems,  
Engineering Change Evaluation No. 34104; Support of CR 146475 - 2A Diesel Generator Slow Start & CR 147003 - 2A DG Tripped During Post Maintenance Testing/BOSR, Revision 0,  
BMP 3108-12; Fuel Control System Adjustment (CM-6.1.), Revision 6,  
BMP 3108-10; Emergency Stand-By Diesel Generator Governor (Electrical Hydraulic and Overspeed) Replacement, Revision 3,  
CR 147056; Quality Receipt Testing Criteria: DG5220, 24 & 27A Valves, February 28, 2003,  
CR 146674; Incorrect Setpoint Found for Spare Part for USY-9, February 27, 2003,  
BAP 1310-8T1; Post-Modification Test for 2RH610 Control Switch (EC338614), February 25, 2003,  
Engineering Change 341402; Flo-Series Evaluation of Replacement Impeller for 2A CV Pump, March 04, 2003,

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CR 139549; Procedure with Improper Component Identification, January 15, 2003,  
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CR 139856; 2B DG Chart Recorder Leads Were Found Disconnected, January 16,  
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BRP 5410-11; Operation and Calibration of the Eberline PM-7 for Whole Body Screening; Revision 6,  
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CR 00139938; NRC Identified - Procedure Typographical Error; January 17, 2003,<sup>1</sup>  
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WO 99215234; Calibrate Detector - Containment Building Fuel Handling Incident (1RE-AR012); March 18, 2002,  
WO 99215235; Calibrate Detector - High Range Containment Radiation Monitor Detector (1RE-AR021); March 18, 2002,  
WO 99251873; Calibration of Main Steam Line Radiation Monitor (1RE-AR022D); July 2, 2002,  
WO 99276655; Calibrate Detector - Containment Building Fuel Handling Incident (2RE-AR011); September 21, 2002,  
WO 99276657; Calibrate Detector - High Range Containment Rad Monitor (2RE-AR020); September 22, 2002,

4OA2 Identification and Resolution of Problems

CR 140753; NRC Concerned Byron Unit 1 May Be Exceeding 100% Power, January 23, 2003,<sup>1</sup>

CR 91771; Unexplained differences between Byron and Braidwood,  
NRC Letter to Exelon; Licensed Thermal Power - Byron Station, Unit 1, January 22, 2003,

Exelon Letter (RS-03-025) to NRC, Byron Station, Unit 1, Licensed Thermal Power Limit Verification, February 5, 2003,

NRC Letter to Exelon; Byron Station, Unit 1 - Summary of Meeting Held on January 24, 2003, with Exelon Generation Company, LLC to Discuss the Licensee Power Limit, February 26, 2003.

<sup>1</sup> NRC Identified

## LIST OF ACRONYMS USED

ALARA	As-Low-As-Reasonably-Achievable
AMAG	Advanced Measurement and Analysis Group
ARM	Area Radiation Monitor
ASME	American Society of Mechanical Engineers
BAP	Byron Administrative Procedure
BEP	Byron Emergency Procedure
BGP	Byron General Operating Procedure
BMP	Byron Maintenance
BOP	Byron Operating Procedure
BOSR	Byron Operating Surveillance Requirement Procedure
BRP	Byron Radiation Protection Procedure
BVSR	Byron Technical Surveillance Requirement Procedure
CFR	Code of Federal Regulations
CR	Condition Report
CV	Charging Pump
DG	Diesel Generator
ECCS	Emergency Core Cooling System
FASA	Focus Area Self-Assessment
HVAC	Heating, Ventilation and Air Conditioning
ICMs	Interim Compensatory Measures
IMC	Inspection Manual Chapter
LOCA	Loss of Coolant Accident
NCV	Non-Cited Violation
NRC	United States Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
NSP	Nuclear Station Procedure
PARS	Publicly Available Records
RP	Radiation Protection
RWP	Radiation Work Permit
SDP	Significance Determination Process
SX	Essential Service Water
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
VA	Auxiliary Building Heating, Ventilation and Air Conditioning System
VHRA	Very High Radiation Area
WO	Work Order
WR	Work Request