April 26, 2002

EA-02-086

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

SUBJECT: BYRON STATION, UNITS 1 AND 2
INSPECTION REPORT 50-454/02-003(DRP); 50-455/02-003(DRP)

Dear Mr. Skolds:

On March 31, 2002, the NRC completed an inspection at the Byron Station, Units 1 and 2. The enclosed report documents the inspection findings which were discussed on April 3, 2002, with Mr. S. Kuczynski and other members of your staff.

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

Two issues of very low risk significance (Green) were identified by inspectors. These issues involved a failure to assess the risk associated with a maintenance activity on the Unit 1 safety injection system and the failure to install the 1B steam generator manway covers in accordance with the maintenance procedure. These issues were determined to involve violations of NRC requirements. However, because of the very low safety significance of the issues and because they were entered into your corrective action program, the NRC is treating the issues as Non-Cited Violations in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you contest 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 Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, Region III; Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Byron Station.

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

We will gladly discuss any questions you have concerning this inspection.

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 50-454/02-003(DRP);
50-455/02-003(DRP)

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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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REGION III

Docket Nos:	50-454; 50-455
License Nos:	NPF-37; NPF-66
Report No:	50-454/02-003(DRP); 50-455/02-003(DRP)
Licensee:	Exelon Generation Company, LLC
Facility:	Byron Station, Units 1 and 2
Location:	4450 N. German Church Road Byron, IL 61010
Dates:	February 12, 2002, through March 31, 2002
Inspectors:	R. Skokowski, Senior Resident Inspector J. Adams, Acting Senior Resident Inspector B. Kemker, Senior Resident Inspector, D.C. Cook P. Snyder, Resident Inspector T. Tongue, Project Engineer R. Winter, Reactor Inspector R. Alexander, Radiation Specialist D. Jones, Reactor Inspector C. Thompson, Illinois Department of Nuclear Safety
Approved by:	Ann Marie Stone, Chief Branch 3 Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000454-02-003(DRP), IR 05000455-02-003(DRP), on 02/12/2001-03/31/2002; Exelon Generation Company, LLC; Byron Station, Units 1 & 2. Maintenance Risk Assessment and Emergent Work, Refueling and Outage Activities.

The baseline inspection was conducted by resident and region based inspectors, regional reactor engineers, and radiation specialists. The inspectors identified two Green findings associated with Non-Cited Violations. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process" (SDP). The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at http://www.nrc.gov/NRR/OVERSIGHT/index.html. Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violation.

A. Inspector Identified Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified (self-revealing) that the licensee failed to perform a maintenance risk assessment prior to performing a maintenance activity on the common suction header for the Unit 1 SI pumps.

  This finding was determined to be of very low safety significance because the failure did not result in the actual loss of the safety system function. A Non-Cited Violation of 10 CFR 50.65 (a)(4), for the failure to perform a risk assessment was identified. (Section 1R13).

Cornerstone: Barrier Integrity

- Green. The inspectors identified that the installation of the 1B steam generator hot and cold leg manway covers was not completed in accordance with applicable maintenance procedures. The failure to properly install the steam generator manway covers adversely affected the reactor coolant system integrity.

  This finding was determined to be of very low safety significance, because the failure did not result in an increase in the likelihood of a significant loss of reactor coolant. A Non-Cited Violation of Technical Specification 5.4.1 a. for the failure to follow the maintenance procedure associated with steam generator manway closure installation was identified. (Section 1R20)

Report Details

Summary of Plant Status

Unit 1 was operated at or near full power until March 11, 2002 when the licensee conducted a reactor shutdown for refueling outage B1R11. Following the completion of the refueling outage, the unit was synchronized to the grid on March 30, 2002. As the inspection period ended, the unit was being returned to full power.

The licensee operated Unit 2 at or near full power for the duration of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R04 Equipment Alignment (71111.04)

a. Inspection Scope

The inspectors verified the system alignment of the equipment listed below during maintenance activities affecting the availability of associated redundant equipment:

- 1B and 2B Essential Service Water System Trains.

This safety related system was selected because it was designed to mitigate the consequences of a potential accident and was identified as risk significant in the licensee's risk analysis. The inspectors performed a walkdown of the accessible portions of the system and verified that the system lineup was in accordance with plant operating procedures and applicable system drawings. The inspectors also assessed the material condition of system equipment and verified that identified discrepancies were properly captured in the licensee's corrective maintenance program. The documents listed at the end of this report were also used by the inspectors to evaluate this area.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

a. Inspection Scope

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

- Unit 1, Division 12 Miscellaneous Electrical Equipment and Battery Room (Zone 2.3.5.7);

- Unit 2, Division 22 Miscellaneous Electrical Equipment and Battery Room (Zone 2.3.5.8);
- Unit 2, Turbine Building Grade Level (Zone 2.3.8.5); and
- Unit 1 Containment Building.

These areas were selected for inspection because risk significant systems, structures and components were located in the areas. The inspectors reviewed applicable portions of the Byron Station Fire Protection Report and assessed the licensee's control of transient combustibles and ignition sources, material condition, and operational status of fire barriers and fire protection equipment. The documents listed at the end of this report were also used by the inspectors to evaluate this area.

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection Activities (71111.08)

a. Inspection Scope

The inspectors evaluated the implementation of the licensee's inservice inspection (ISI) program for monitoring degradation of the reactor coolant system boundary and the risk significant piping system boundaries. Specifically, the inspectors verified through observations that the in-process ultrasonic inspection of the 1A steam generator tubesheet to lower barrel weld (1RC-01-BA) was conducted in accordance with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code requirements. The inspectors also reviewed radiographic film of welds 1MS020AA-FW#1, FW#2, and FW#3, inservice inspection procedures and personnel certifications.

The inspectors reviewed the NIS-2 forms for Code repairs performed during the last Unit 2 outage and confirmed that ASME Code requirements were met. In addition, a sample of inservice inspection related problems documented in the licensee's corrective action program, was also reviewed to assess conformance with 10 CFR Part 50 Appendix B, Criterion XVI, "Corrective Action," requirements. In addition, the inspectors determined that operating experience was correctly assessed for applicability by the ISI group.

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation (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 equipment and system:

- Unit 1 and 2 Leak Detection of Systems within Containment (Function RF-1).

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. The inspectors interviewed several members of the licensee's engineering staff regarding the performance of the containment sump flow monitors associated with this maintenance rule function. The documents listed at the end of 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 maintenance rule related issues documented in selected condition reports.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed the licensee's evaluation of plant risk for maintenance activities on the following equipment:

- 1B Essential Service Water Pump Discharge Valve Out-of-Service and Removal/Replacement; and
- 2A Emergency Diesel Generator, Emergent Replacement of the Oil for Generator Bearing.

The inspectors selected these maintenance activities because they involved systems that were risk significant in the licensee's risk analysis, or were considered significant as potential initiating events. During this inspection, the inspectors assessed the operability of redundant train equipment and verified that the licensee's planning of the maintenance activities minimized the length of time that the plant was subject to increased risk. The inspectors interviewed operations, engineering, maintenance, and work control department personnel. For the essential service water maintenance, the inspectors also verified that the equipment determined to be protected equipment was properly posted and that the appropriate risk-related information was provided to plant staff during shift briefings and turnovers.

In addition, the inspectors reviewed the events associated with the September 27, 2001, maintenance activity that resulted in a leak on the common suction header for the safety injection (SI) pumps. Repair of the leak necessitated isolation of the common suction header, rendering both SI pumps inoperable, placing the plant in Technical Specification 3.0.3, and initiation of a plant shutdown. This event was evaluated under review of Licensee Event Report (LER) 50-454-2001-003-00: "Entry into Technical Specification

Limiting Condition for Operation 3.0.3 Due to a Leak on a Safety Injection Valve Weld Caused by a Pre-existing Condition and Failing to Use Correct Work Scope Revision Process."

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

b. Findings

A finding of very low safety significance (Green) was self-revealed. Specifically, the licensee failed to perform a maintenance risk assessment prior to performing a maintenance activity on the common suction header for the Unit 1 SI pumps. The inspectors determined that this failure was a Non-Cited Violation of 10 CFR 50.65 (a)(4).

On September 27, 2001, the licensee initiated a design change to the Unit 1 SI pump common suction header to facilitate venting operation. In conjunction with this design change, the licensee also performed an additional maintenance activity to enhance the soc-o-let weld on the common header vent valve. While enhancing the soc-o-let weld on the common header vent valve, the existing weld began to leak. Upon identification of the leak, the licensee declared both trains of SI inoperable and commenced a plant shutdown in accordance with Technical Specification 3.0.3. The licensee removed both SI pumps from service, drained and repaired the applicable portion of the piping, and successfully tested the weld. The unit was at approximately 25% power when Technical Specification 3.0.3 was exited, and the operators returned the plant to full power.

The cause of the event as described in the LER was as a result of not using the formal process to evaluate the weld enhancement. In addition, the license determined that a risk assessment for the on-line maintenance was not completed as required by the station's Conduct of Maintenance Manual.

The inspectors determined that this issue had a credible impact on safety, specifically, on the operablity of the SI system. However, subsequent reviews by the licensee determined that the leak would not have prevented the SI pumps from performing the designed safety function. The inspectors evaluated this issue through the significance determination process (SDP) and determined that this issue was of very low safety significance (Green), because the failure did not result in the actual loss of the safety system function.

10 CFR 50.65 (a)(4), states, in part, that the licensee shall assess and manage the increase in risk that may result from proposed maintenance activities. Contrary to the above, the licensee failed to perform a maintenance risk assessment prior to performing a maintenance activity, specifically, enhancing a weld on a drain valve in the common suction header for the Unit 1 SI pumps. However, because of the very low safety significance of the item and because the licensee had included this item in the corrective action program (Condition Report B2001-76849) this violation is being treated as a Non-Cited Violation (50-454-02-03-01(DRP)).

1R14 Personnel Performance During Non-routine Plant Evolutions (71111.14)

a. Inspection Scope

The inspectors observed activities throughout the Unit 1 shutdown for refueling outage B1R11. In particular, the inspectors monitored status briefings, procedure usage, communications, and command and control. This non-routine plant evolution was selected for observation to evaluate the performance of the operators and qualified nuclear engineers. The documents listed at the end of this report were also used by the inspectors to evaluate this area.

b. Findings

During the plant shutdown on March 11, 2002, the licensee experienced difficulties with the startup feedwater pump, such that it was not available for use at the point specified in the Byron General Operating Procedure 100-4, "Power Descension," Revision 24. Therefore, the operators used the motor driven feedwater pump to complete the shutdown. Although the use of the motor driven feedwater pump in leu of the startup feedwater pump was described in the power descension procedure, the licensee decided to make an exception to the procedure and trip the turbine generator at 180 Megawatts electric (MWe) instead of the specified 100 MWe. Upon tripping the turbine generator, the steam dump valves did not open as expected. As a result, the steam generator (SG) pressure increased and the SG atmospheric relief valves lifted to provided the necessary plant cooldown.

Subsequent review of the shutdown by the licensee determined that the operators failed to place the steam dumps in the pressure control mode prior to tripping the turbine generator as specified by the power descension procedure. It appears that during the operators' evaluation for the procedure exception to trip the turbine generator at a higher power, they failed to adequately consider the impact on the steam dump valves. The use of exceptions to the general plant operating procedures was allowed by the Byron Administrative Procedure 1310-10, "Procedure Use and Adherence, Byron Addendum," Revision 6, and it only required that exceptions were properly noted. The decision to trip the turbine at a higher power was noted as a procedure exception for the power descension procedure during the March 11, 2002-shutdown, however, the exception did not explicitly describe the actions associated with the steam dump valve control mode.

The licensee initiated Condition Report (CR) 00098784, to review the circumstances regarding this issue. Pending the completion of the licensee review of this issue, including the associated apparent cause analysis, and subsequent inspector review, this issue will be tracked as an Unresolved Item (50-454-02-003-02).

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the licensee's justification for not correcting existing degraded and nonconforming conditions during refueling outage B1R11 to ensure consistency with the timeliness guidance contained in Generic Letter 91-18, "Information to Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions," Revision 1. The documents listed at the end of this report were also used by the inspectors to evaluate this area.

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds (OWAs) (71111.16)

a. Inspection Scope

The inspectors reviewed OWAs to identify any potential effect on the function of mitigating systems or the ability of operators to respond to an event and implement abnormal and emergency operating procedures. The inspectors interviewed selected engineering licensee personnel and evaluated the following OWA:

- OWA 258, "Boric Acid Controller Overshoot."

This OWA discussed the boric acid controller that was not getting consistent results from the existing counters. The operators workaround was to use batch additions rather than using the controller for boration control. The inspectors reviewed the licensee's proposed design change to replace existing counters with digital Predetermining Counters for the Boric Acid Batch and Make-up Water functions. The documents listed at the end of the report were used in the assessment of this area.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17)

a. Inspection Scope

The inspectors reviewed the permanent modification listed below:

- EC 332356, "Letdown Booster Pump Installation Mod," Revision 0; and
- Pressurizer Spray Line Low Temperature Alarm Set Point Change from 530 to 525 degrees Fahrenheit (^{o}F) Due to Power Uprate Implementation Change to Tcold and to Support Operation of the Pressurizer Variable Heaters per OP Assessment 99-023.

The inspectors reviewed the Letdown Booster Pump Installation modification installed online during February, 2002 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 also verified that the modifications did not place the plant in an unsafe configuration. The inspectors considered the design adequacy of the

modifications by performing a review, or partial 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.

The documents listed at the end of the report were used in the assessment of this area.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors evaluated the licensee's post maintenance testing activities for maintenance conducted on the following equipment:

- Unit 1 Charge System Booster Pump; and
- Unit 1 Safety Injection Relief Valve.

The inspectors reviewed the scope of the work performed and evaluated the adequacy of the specified post maintenance testing. The inspectors verified that the post maintenance testing was performed in accordance with approved procedures, the procedures stated acceptance criteria, and the acceptance criteria were met. The inspectors also evaluated the adequacy of work controls (including foreign material exclusion controls), reviewed post-maintenance test data, and conducted walkdowns to verify system restoration after the testing was completed. The documents listed at the end of this report were also used by the inspectors to evaluate this area.

In addition, the inspectors reviewed selected 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.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities (71111.20)

Inspection Scope

The inspectors evaluated the licensee's conduct of B1R11 refueling outage activities to assess the licensee's control of plant configuration and management of shutdown risk. The inspectors reviewed configuration management to verify that the licensee maintained defense-in-depth commensurate with the shutdown risk plan; reviewed major outage work activities to ensure that correct system lineups were maintained for key mitigating systems; and observed refueling activities to verify that fuel handling operations were performed in accordance with the Technical Specifications (TS) and

approved procedures. Other major outage activities evaluated included the licensee's control of:

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

The inspectors observed portions of the plant cooldown, including the transition to shutdown cooling, to verify that the licensee controlled the plant cooldown in accordance with the TS. In addition, the inspectors evaluated portions of the restart activities to verify that requirements of the TS and administrative procedure requirements were met prior to changing operational modes or plant configurations. Major restart inspection activities performed included:

- verification that RCS boundary leakage requirements were met prior to entry into mode 4 (cold shutdown) and subsequent operational mode changes;
- verification that containment integrity was established prior to entry into mode 4;
- inspection of the containment building to assess material condition and search for loose debris, which if present could be transported to the containment recirculation sumps and cause restriction of flow to the emergency core cooling system (ECCS) pump suctions during loss-of-coolant accident conditions; and
- verification that the material condition of the containment building ECCS recirculation sumps met the requirements of the TS and was consistent with the design basis.

The inspectors interviewed operations, engineering, work control, radiological protection, and maintenance department personnel and reviewed selected procedures and documents.

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 refueling outage issues documented in selected condition reports.

The documents listed at the end of the report were used in the assessment of this area.

b. Findings

The inspectors identified a finding of very low safety significance (Green). In particular, the installation of the 1B steam generator hot and cold leg manway covers was not completed in accordance with applicable maintenance procedures. The failure to

properly install the steam generator manway covers adversely affected the reactor coolant system integrity. The inspectors determined that this failure was a Non-Cited Violation of Technical Specification 5.4.1.

On March 26, 2002, during the inspectors' independent inspection of the Unit 1 containment, the inspectors identified a leak on the 1B steam generator (SG). This inspection was performed after the licensee completed their containment inspection in preparation for entering Mode 4 (Hot Shutdown). At this time, the reactor coolant pressure and temperature were at 350 psig and < 200^{o}F respectively. Upon being informed of the leak, the licensee determined that the primary (reactor coolant) side hot leg manway cover was leaking at a rate of approximately one drop per second. During the subsequent extent of condition review, the licensee discovered that a small leak also existed on the cold leg manway of the same SG.

As a result of these leaks, the licensee cooled down and depressurized the plant to complete the repairs to the 1B SG manway covers. In addition, the licensee initiated reviews to determine the cause of the leaks and to determine if the other steam generators were impacted. The licensee inspected the other SGs and found no additional leaks. In addition, based on a review of the work performed on the SGs during the outage, the licensee determined that the crew that worked on the 1B SG did not work on any other SG. Based on these facts, the licensee preliminarily concluded that the other SGs were not affected.

The inspectors reviewed the licensee's procedures completed for the installation of the 1B SG hot and cold leg manway covers and discussed the issue with various members of the licensee's staff. The inspectors also reviewed the licensee's root cause determination effort, which included a demonstration of a SG manway cover installation completed on a mocked-up SG. Based on these reviews the inspectors concluded that the licensee failed to adequate implement Procedure BMP-3300-21, "Unit 1 Steam Generator Primary Manway Closure Removal; and Installation."

Two steps on the manway installation procedure were not properly completed while the installing the 1B SG manway covers. Step 4.14.14 item 10 specified that the threads of the studs, bell nuts and under the bell nuts be lubricated with a light coat of lubricant. Based on the as-found condition of the bell nuts, there was no indication of lubricant at the bottom of the bell nuts. Without the proper lubrication, the bell nuts would prematurely appear to be tightened to the proper torque value. Step 4.14.27 for the measuring of the as-left stud elongation was to be completed after the tensioning device was depressurized. Based on an analysis and subsequent measurements, the licensee determined that these as-left elongation measurements were taken with the tensioning device still pressurized. Furthermore, all but one of the as-left recorded measurements obtained during the manway installation for both the hot and cold leg manways were outside the target values. Although these values were evaluated as acceptable, this evaluation was based on a past method for measuring elongation that tended to be less accurate.

The inspectors determined that the failure to properly lubricate the bell nuts and to properly measure manway stud elongation for the 1B SG as prescribed in the station procedure adversely affected the reactor coolant system integrity. The inspectors

evaluated this issue through the shutdown SDP and determined this issue was of very low safety significance (Green), because the incorrectly installed steam generator manway covers did not result in a significant loss of reactor coolant inventory.

Technical Specification 5.4.1, states, in part, that "Written procedures shall be established, implemented, and maintained covering the following activities: The applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978." Paragraph 9.a. of this Regulatory Guide states, in part, that procedures for performing maintenance that can affect the performance of safety-related equipment shall be prepared and activities shall be performed in accordance with these procedures. The licensee established Procedure BMP-3300-21, "Unit 1 Steam Generator Primary Manway Closure Removal; and Installation," Revision 4 as the implementing procedure for installing the SG manway covers. Contrary to the above, in March 2002, the technicians failed to adequately lubricate the bell nuts and failed to adequately measure the as-left stud elongation for the 1B Steam Generator hot and cold leg manway covers as required by steps 4.14.14 and 4.14.27 of Procedure BMP-3300-21. This is considered a violation of Technical Specification 5.4.1. However, because this violation was of very low risk significance, was non-repetitive, and was captured in the licensee's corrective action program (CR 00100975), this violation is being treated as a Non-Cited Violation in accordance with Section V1.A.1 of the NRC Enforcement Policy (NCV 50-454-02-03-03 (DRP)).

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed and reviewed the performance of the following surveillance testing on risk-significant equipment:

- 1BOSR FW-SA1, "Unit One Anticipated Transient Without SCRAM Mitigation System at Power Semiannual Surveillance Revision 3;
- 1BOSR 3.2.9.2, "Unit 1 Train B Manual Safety Injection and Manual Phase A Initiation Surveillance," Revision 9 ;
- 1BOSR 8.1.9.2, "1B Diesel Generator Safe Shutdown Sequencer and Single Load Rejection Test," Revision 0;
- 1BOSR 6.3.6-1, "Unit One Primary Containment Type C Local Leakage Rate Tests of Containment Miniflow Purge Isolation Valves," Revision 4; and
- 1BOSR Z.5.b.1-1, "Unit 1 Containment Loose Debris Inspection," Revision 2.

The inspectors selected these surveillance test activities because the system functions were identified as risk significant in the licensee's risk assessment and the components were credited as operable in the licensee's safety analysis to mitigate the consequences of a potential accident. Regarding the Unit 1 containment inspection, following the completion of the licensee's inspection, the inspectors performed an independent visual inspection of the Unit 1 containment. The inspectors interviewed operations, maintenance, and engineering department personnel; reviewed the completed test documentation; and observed the performance of all or portions of these surveillance testing activities. The documents listed at the end of this report were also used by the inspectors to evaluate this area.

b. Findings

Except for the finding associated with the leaking 1B steam generator manway cover described in Section 1R20, no findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed the temporary modifications listed below to verify that the installation was consistent with design modification documents and that the modification did not adversely impact system operability or availability:

- Operation of the Reactor Containment Fan Coolers without Containment Chillers; and
- EC 335829, "Installation of Temporary Pipe Supports for Main Steam Line 1MS01CC-32 3/4," Revision 0.

The documents listed at the end of the report were used in the assessment of this area.

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, Radiological Boundary Verification, and Radiation Work Permit (RWP) Reviews

a. Inspection Scope

The regional radiation protection inspector reviewed the station's implementation of physical and administrative controls over access to radiologically controlled areas (RCAs), including worker adherence to these controls, by reviewing station procedures, RWPs, electronic dosimetry alarm set points, and walking down radiologically significant areas (high radiation areas (HRAs), locked HRAs, and radiation areas) of the station. Specifically, areas in the Unit 1 Containment, the Unit 1 Containment Access Facility, and the Auxiliary Building were observed to verify these areas were posted and controlled in accordance with 10 CFR Part 20, licensee procedures, and Technical Specifications.

b. Findings

No findings of significance were identified.

.2 Identification and Resolution of Problems

a. Inspection Scope

The regional radiation protection inspector reviewed Nuclear Oversight field observations and licensee Condition Reports completed in conjunction with the B1R11 Refueling Outage which focused on access control to radiologically significant areas, radiation worker practices, and radiation protection (RP) technician practices. The inspector 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 Radiological Work/ALARA Planning

a. Inspection Scope

The regional radiation protection inspector reviewed the station's procedures for radiological work/ALARA planning and scheduling, and evaluated the dose projection methodologies and practices implemented for the B1R11 Refueling Outage, to verify that sound technical bases for outage dose estimates existed. Specifically, the inspector reviewed six radiologically significant RWP/ALARA planning packages to verify that adequate person-hour estimates, job history files, lessons learned, and industry experiences were utilized in the ALARA planning process. As part of the reviews of the planning packages, the inspector reviewed Total Effective Dose Equivalent (TEDE) ALARA evaluations developed for RWP Nos. 10000560, 10000562, and 10000563, to assess the licensee's analysis for the potential use of respiratory protection equipment during those evolutions. The inspector also attended the mid-outage Station ALARA Committee Meeting and reviewed RP/Operations-coordinated dose rate reduction activities (e.g., pipe flushing, shield packages, timing of forced oxidation) to further assess inter-departmental coordination and ownership in the radiological work/ALARA planning and scheduling processes.

b. Findings

No findings of significance were identified.

.2 Job Site Inspections and ALARA Controls

a. Inspection Scope

The regional radiation protection inspector observed work activities in the RCA that were performed in radiation areas, HRAs, and locked HRAs to evaluate the use of ALARA controls. Specifically, the inspector reviewed radiological surveys, attended pre-job

radiological briefings, and assessed job site ALARA controls, in part, for the following work activities:

- Steam generator manway diaphragm removal (RWP No. 10000560);
- Steam generator nozzle covers installation (RWP No. 10000562);
- Steam generator eddy current testing (RWP No. 10000563);
- Steam generator secondary-side sludge lancing (RWP No. 10000564);
- Miscellaneous air operated valve work (RWP No. 10000573); and
- Reactor head disassembly, including head lift (RWP No. 10000576).

Worker instruction requirements including protective clothing, engineering controls to minimize dose exposures, the use of predetermined low dose waiting areas, as well as the on-the-job supervision by the work crew leaders and RP technicians were observed to determine if the licensee had maintained the radiological exposure for these work activities ALARA. Enhanced job controls including RP technician use of electronic teledosimetry and remotely monitored cameras were also evaluated to assess the licensee's ability to maintain real time doses ALARA in the field. Additionally, the inspector observed the implementation of dosimetry placement changes necessitated by significant dose rate gradients during steam generator nozzle cover installation "jumps" (per the requirements of RWP No. 10000562).

b. Findings

No findings of significance were identified.

.3 Radiation Worker Performance

a. Inspection Scope

The regional radiation protection inspector observed radiation workers performing the activities described in Section 2OS2.2 and evaluated their awareness of radiological conditions, personal electronic dosimetry alarm set points, and their implementation of applicable radiological controls.

b. Findings

No findings of significance were identified.

.4 Verification of Dose Estimates, Dose Trending, and Dose Tracking Systems

a. Inspection Scope

The regional radiation protection inspector reviewed the licensee's total outage dose estimates, selected individual job dose estimates and the related dose trending for the B1R11 Refueling Outage. As of March 20, 2002, (day 9 of an estimated 14 day outage), the licensee had recorded a collective dose of 62.634 person-rem compared to the total estimate of 116.149 person-rem for the outage. Work-in-Progress reviews for RWP Nos. 10000558, 10000560, and 10000573 were examined to evaluate the licensee's ability to assess the effectiveness of the ALARA plans in a timely manner and

institute changes in the plan or its execution, if warranted. The licensee's dose tracking system was also reviewed to determine if the level of dose tracking detail, dose report timeliness, and report distribution were sufficient to support the control of collective dose. Additionally, the inspector reviewed dose tracking records for all workers on selected steam generator-related RWPs, to assess the licensee's effectiveness in maintaining individual exposures ALARA and minimizing significant dose variations across the workgroups.

b. Findings

No findings of significance were identified.

.5 Source Term Reduction and Control

a. Inspection Scope

The regional radiation protection inspector reviewed the status of the station's source term reduction program focusing on those initiatives with the greatest potential to impact outage doses (i.e., hot spot tracking, pipe flushing, temporary and permanent shielding, and shutdown chemistry controls). The inspector also assessed the general trend of the station's total source term by reviewing historical and current containment baseline dose rates to evaluate the effectiveness of the station's source term reduction plan.

b. Findings

No findings of significance were identified.

.6 Identification and Resolution of Problems

a. Inspection Scope

The regional radiation protection inspector reviewed Nuclear Oversight field observations and licensee CRs completed in conjunction with the B1R11 Refueling Outage which focused on ALARA planning and controls. The inspector additionally reviewed a focus area self-assessment for the ALARA program and [B1R11] outage readiness conducted by the RP Department. The inspector reviewed these documents to assess the licensee's ability to identify repetitive problems, contributing causes, the extent of conditions, and develop corrective actions intended to achieve lasting results.

b. Findings

No findings of significance were identified.

4OA3 Event Followup

.1 (Closed) Licensee Event Report (LER) 50-454-2001-003-00: "Entry into Technical Specification Limiting Condition for Operation 3.0.3 Due to a Leak on a Safety Injection Valve Weld Caused by a Pre-existing Condition and Failing to Use Correct Work Scope

Revision Process" This event is discussed in Section 1R13 of this report. This LER is closed.

.2 (Closed) Licensee Event Report (LER) 50-454-2001-003-01: "Entry into Technical Specification Limiting Condition for Operation 3.0.3 Due to a Leak on a Safety Injection Valve Weld Caused by a Pre-existing Condition and Failing to Use Correct Work Scope Revision Process," Supplement 1. The licensee submitted Supplement 1 to LER 50-454-2001-003 to provide additional corrective actions for the event. The inspectors determined that the information provided in Supplement 1 to LER 50-454-2001-003 did not raise any new issues or change the conclusions of the initial review which is documented in Section 1R13 of this report. This LER is closed.

40A5 Other

.1 Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles (Temporary Instruction 2515/145)

a. Inspection Scope

The inspectors performed a review of the licensees' activities in response to NRC Bulletin 2001-01, "Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles," to verify compliance with applicable regulatory requirements. In accordance with the guidance of NRC Bulletin 2001-01, the Byron Plant was characterized as belonging to the sub-population of plants (Bin 4) that were considered to have a low susceptibility to primary stress corrosion cracking based upon a susceptibility ranking of more than 30 effective full power years of operation from that of the Oconee Nuclear Station, Unit 3, condition. The anticipated low likelihood of primary water stress corrosion cracking (PWSCC) degradation at the Bin 4 facilities indicates that enhanced examination beyond the present requirements is not currently necessary because enhanced examination is not likely to yield additional evidence of the propensity for PWSCC in vessel head penetration nozzles.

b. Findings

No findings of significance were identified.

4OA6 Meetings

.1 Interim Exits

a. The results of the occupational radiation safety access control and ALARA inspection were presented to Mr. Rich Lopriore and other members of licensee management at the conclusion of the inspection on March 20, 2002. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

b. The results of the Inservice Inspection was presented to Mr. Rich Lopriore and other members of licensee management at the conclusion of the inspection on March 22,

2002. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

.2 Resident Inspector 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 April 3, 2002. The licensee acknowledged the findings presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

KEY POINTS OF CONTACT

Licensee

R. Lopriore, Site Vice President
S. Kuczynski, Station Manager
B. Adams, Engineering
B. Altman, Maintenance Manager
D. Goldsmith, Radiation Protection Director
D. Combs, Site Security Manager
G. Contrady, Engineering Programs Supervisor
D. Drawbaugh, Byron NRC Coordinator
D. Goldsmith, Radiation Protection Manager
B. Grundmann, Regulatory Assurance Manager
K. Hansing, Site Nuclear Oversight Manager
D. Hoots, Operations Manager
S. Kerr, Chemistry Manager
W. Kolo, Work Management Director
T. Roberts, Engineering Director
B. Sambito, Byron Radiation Protection
D. Spoerry, Training Manager
S. Stimac, Shift Operations Superintendent
D. Thompson, Radiation Protection Dose Assessment Health Physicist

Nuclear Regulatory Commission

A. Stone, Chief, Projects Branch 3, Division of Reactor Projects
M. Parker, Senior Reactor Analyst

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-454-02-03-01	NCV	Failure to Assess and Manage the Risk associated with the Safety Injection Common Header Welding Activity
50-454-02-03-02	URI	Procedure Review to Trip the Turbine Generator at a Higher Power than Prescribed by the Procedure
50-454-02-03-03	NCV	Failure to Follow the Procedure for the Installation of the 1B Steam Generator Manway Cover

Closed

50-454-02-03-01	NCV	Failure to Assess and Manage the Risk associated with the Safety Injection Common Header Welding Activity
50-454-02-03-03	NCV	Failure to Follow the Procedure for the Installation of the 1B Steam Generator Manway Cover
50-454-2001-003- 00	LER	Entry into Technical Specification Limiting Condition for Operation 3.0.3 Due to a Leak on a Safety Injection Valve Weld Caused by a Pre-existing Condition and Failing to Use Correct Work Scope Revision Process
50-454-2001-003- 01	LER	Entry into Technical Specification Limiting Condition for Operation 3.0.3 Due to a Leak on a Safety Injection Valve Weld Caused by a Pre-existing Condition and Failing to Use Correct Work Scope Revision Process, Supplement 1

Discussed

None

LIST OF ACRONYMS USED

ALARA	As-Low-As-Reasonably-Achievable
ASME	American Society of Mechanical Engineers
B1R11	Unit 1's Eleventh Refueling Outage
BAP	Byron Administrative Procedure
BGP	Byron General Operating Procedure
BISR	Byron Instrument Maintenance Surveillance Requirement Procedure
BOA	Byron Abnormal Operating Procedure
BOL	Byron Limiting Condition for Operation Action Requirement 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
CV	Control Room Ventilation
DRP	Division of Reactor Projects
ECCS	Emergency Core Cooling System
GL	Generic Letter
HRA	High Radiation Area
ISI	Inservice Inspection
LCOAR	Limiting Condition for Operation Action Requirement
LER	Licensee Event Report
MWe	Megawatts Electric
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NSP	Nuclear Station Procedure
OD	Operability Determination
ODCM	Offsite Dose Calculation Manual
OWA	Operator Work-Around
PWSCC	Primary Water Stress Corrosion Cracking
RCA	Radiologically Controlled Area
RCS	Reactor Coolant System
RP	Radiation Protection
RWP	Radiation Work Permit
SDP	Significance Determination Process
SG	Steam Generator
SI	Safety Injection
SSC	Systems, Structures, and Components
TEDE	Total Effective Dose Equivalent
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VC	Control Room Heating, Ventilation and Air Conditioning System
WO	Work Order
WR	Work Request

LIST OF DOCUMENTS REVIEWED

1R04 Equipment Alignment

	Byron Station Technical Specifications (TS)	
	Byron/Braidwood Stations Update Final Safety Analysis report (UFSAR)	
BOP SX-E1B	Unit 1 Essential Service Water Train “B” Electrical Lineup	Revision 2
BOP SX-E2B	Unit 2 Essential Service Water Train “B” Electrical Lineup	Revision 1
BOP SX-M1B	Unit 1 Essential Service Water Train “B” Valve Lineup	Revision 6
BOP SX-M2B	Unit 2 Essential Service Water Train “B” Valve Lineup	Revision 6
Drawing M-42	Diagram of Essential Service Water - Unit 1	
Drawing M-126	Diagram of Essential Service Water - Unit 2	

1R05 Fire Protection

	Byron/Braidwood Stations Fire Protection Report	Revision 19
	Byron Station Pre-Fire Plans and Drawings	
BAP 1100-17T1	Byron Station Pre-Fire Plan	Revision 0
BAP 1100-7	Fire Prevention for Transient Combustibles	Revision 10
BAP 1100-7A1	Minor Transient Combustibles	Revision 1
	Byron/Braidwood Stations Fire Hazards Analysis, Sections2.3.3.17, 2.3.5.3 and 2.3.5.4	Amendment 18, December 1998
	National Fire Protection Association Code, Chapter 72E, “Automatic Fire Detectors,” Section 4-3	1984

	Byron/Braidwood Units 1 and 2 Fire Protection Program Documentation Package, Part 4, Book 1, Sargent & Lundy/Consultant-Generated Documents and Correspondence, "Evaluation of Fire Detection Systems."	
Byron Drawing M-58, Sheet 5	Diagram of Fire Protection Portable Fire Extinguisher Location	

1R08 Inservice Inspection

EXE-PDI-UT-1	Ultrasonic Examination of Erritic Pipe Welds in Accordance with PDI-UT-1	March 11, 2002
EXE-ISI-11	Liquid Penetrant Examination	March 4, 2002
EXE-ISI-170	Magnetic Particle Examination	February 6, 2002
NDT-E-2	Multifrequency Eddy Current Data Acquisition of Steam Generator Tubing at Braidwood and Byron Nuclear Stations	June 22, 2000
	Byron Unit 1 B1R11, Steam Generator Eddy Current Inspection, Inspection Results	March 2002
ER-AP-335-040	Evaluation of Eddy Current Data for Steam Generator Tubing	July 3, 2001
ER-MW-335-1002	Steam Generator Eddy Current Data Analysis Guidelines for Braidwood and Byron Stations Unit 1	February 5, 2002
AR 00080066	Work Packages Documentation Errors (Welding)	October 19, 2001
AR 00080481	Uncontrolled Welding Filler Metal	October 19, 2001
CR B2000-03233	Review of Contractor Visual Inspection Certifications	October 17, 2000
Byron Letter: 2001-5029	Byron Station Unit 2 90-Day Inservice Inspection Report for Interval 2, Period 1, Outage 2 (B2R09)	July 19, 2001
NDT-A	Radiographic Examination	August 1, 1999

1R12 Maintenance Rule Implementation

	Technical Requirements Manual	
Maintenance Rule-Performance Criteria	Leak Detection of Systems Inside Containment	Criteria: RF1
CR 00092599	2RF008 Containment Floor Drains Flow High Annunciated	January 28, 2002
CR 00096513	Elevated Run Times for U2 Containment Floor Drains Sump Pump	February 24, 2002
CR 00097770	Problems With Reactor Coolant System Leakage Detection Systems	March 4, 2002
WC-AA-110	Complex Troubleshooting	March 18, 2002
CR 82449	Containment Floor Drain Sump (1RF008) Flow Rate Increasing	December 10, 2002

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

	Byron Technical Specifications	
BAP 370-1	Station Lubrication Program	Revision 07
BAP 370-2	Station Sampling Program	Revision 06
1BOA PRI-7	Essential Service Water Malfunction Unit 1	Revision 7
	Risk Assessment	Week of March 04, 2002, Revision 1
MA-MW-716-230-1001	Used Oil Data Interpretation Guidelines	Revision 0
WR 00037709	Diesel Generator Outboard Bearing Oil Sample Low Viscosity	February 21, 2002
CR 00096192	2A Diesel Generator Bearing Oil Sample Low Viscosity	February 21, 2002
	Byron Station Shutdown Risk Manual B1R11	
Drawing M-61 Sheet 1A	Diagram of Safety Injection System	Rev. AN
WR# 97124197-01	Document #2, Isometric Drawing 1SI081	Rev. 0

CR- 00076849	Unplanned Limiting Condition for Operation Action Requirements (LCOAR) 1BOL 3.0.3 due to Both Trains of U-1 Safety Injection OOS for Repair of Weld Leak on 1SI081 Vent Valve	September 27, 2001
LER 50-454-2001-003-00	Entry into Technical Specification Limiting Condition for Operation 3.0.3 Due to a Leak on a Safety Injection Valve Weld Caused by a Pre-existing Condition and Failing to Use Correct Work Scope Revision Process	November 26, 2001
LER 50-454-2001-003- 01	Entry into Technical Specification Limiting Condition for Operation 3.0.3 Due to a Leak on a Safety Injection Valve Weld Caused by a Pre-existing Condition and Failing to Use Correct Work Scope Revision Process, Supplement 1	January 28, 2002
Prompt Investigation Report:	Unplanned LCOAR 1BOL 3.0.3 Due to Both Trains of U-1 Safety Injection Out-of-Service for Repair of Weld Leak on 1SI081 Vent Valve	September 28, 2001
Root Cause Investigation Report	Byron Unit 1 Entry into Technical Specification 3.0.3 due to Both Trains of SI Inoperable Caused by a Leak on 1SI081 Vent Valve Piping	November 5, 2001

1R14 Personnel Performance During Non-routine Plant Evolutions

	Byron Station Technical Specifications	
	Byron Braidwood Stations UFSAR	
	Unit 2 Risk Configurations	September 24-September 30, 2001
	Shift Manager's Logs	March 11 & 12, 2002
0BOL PR1	Steam Generator Tube Leak Monitoring Equipment	Revision 3
OP-AA-101-102	Roles and Responsibilities of On-Shift Personnel	Revision 3
BAP 1310-10	Procedure Use and Adherence, Byron Addendum	Revision 6
1BGP 100-2	Plant Startup	Revision 27

1BGP 100-3	Power Ascension	Revision 35
1BGP 100-4	Power Descension	Revision 24
1BGP 100-5	Plant Shutdown and Cooldown	Revision 35
BMP 3118-3	Reactor Vessel Upper Internals Removal	Revision 14
BMP 3118-1	Reactor Vessel Closure Head Removal	Revision 18
BOP FW-7	Startup of a Motor Driven Feedwater Pump	Revision 13
CR 00098597	Procedure BOP RH-6 Does Not Meet Expectations	March 6, 2002
CR 00098775	Unit 1 Steam Dump Operation Inappropriate Response	March 12, 2002
CR 00098784	B1R11 Shutdown Events and Unexpected Occurrences	March 12, 2002
Regulatory Guide 1.33	Quality Assurance Program Requirements	February 1978

1R15 Operability Evaluations

	Byron Station TS	
	Byron/Braidwood Stations UFSAR	
	Byron Station Technical Requirement Manual	
NSP CC-3001	Operability Determination Process	Revision 0
NSP LS-AA-105-1000	Operability Determination Guidance Manual	Revision 0
NRC Generic Letter 91-18	Information to Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions	Revision 1
NRC Inspection Manual, Part 9900	Operable/Operability: Ensuring the Functional Capability of a System or Component	October 8, 1997
LER 50-454-1997-017-01	Completion of Shutdown Initiated Due to Degraded Condition of Safety Injection System Found During Monthly Venting Surveillance	November 7, 1997

Root Cause Report 454-230-97-CAQS00058	Trend 97-058, Maintenance Rule Reactor Coolant System (RC1 Function) Additional Scope (a)(1)	December 8, 1997
CR B2000-02391	Safety Injection Pump Discharge Pressure Increases After Accumulator Fill	October 31, 2000
Problem Identification Form B1997-03509	Emergency Notification System Notification Due to Gas Found in Safety Injection System During Monthly Vent Surveillance	November 9, 1997

1R16 Operator Work-Arounds

OWA 258	Boric Acid Controller Overshoot	
DCP 331826	Replacement of Pre-determining Counters 2FY-0110B and 2FY-0111B	Revision 0
B2001-02424	Unit 2 Primary Water Flow Controller Output Insufficient in Alternate Dilute Mode	May 23, 2001
B2001-02461	Low Boration Flow Control Problem Continues to Produce Repeat Work Requests & Engineering Requests	May 25, 2001
B2001-03081	Replacement Unit 2 Boric Acid flow Totalizer Failure	July 13, 2001

IR 17 Permanent Plant Modifications

	Byron Technical Specifications
	Byron Final Safety Analysis Report, Applicable Portions
Westinghouse Letter SEE-01-300	Byron/Braidwood Pressurizer Spray Line Low Temperature Alarm for Power Uprate Project
50.50 Screening Form	Implementation of the Pressurizer Spray Line Low Temperature Alarm for Power Uprate Project
50.59 Review Cover Sheet Form	Implementation of the Pressurizer Spray Line Low Temperature Alarm for Power Uprate Project

CC-AA-103	Design Change Approval Design Change Package No. EC 333674/SSC 01-061	Revision 0
EC 332356	Letdown Booster Pump Installation Mod	Revision 0
CR B2001-02334	Corrective Actions; “Restore Backup Heater Operation to Design Unit 1 and 2, “Operability Determination 99-0233, Revision 2	

1R19 Post Maintenance Testing

	Byron/Braidwood Stations UFSAR	
	Byron Station TS	
	Byron Station Technical Requirement Manual	
BIP 2000-TO	HP Turb First Stage Press Transmitter	Revision 1
CR 00095551	Spike Induced MW Swing of Unit 2 Resulting in 100.7% power	February 17, 2002
WO 00409928	Investigate Spike on 2PT-MS002, Replace if Questionable	February 21, 2002
BMP 3100-23	Inservice Testing Crosby Safety/Relief Valve Bench Testing	Revision 13
SPP 01-029	Byron Unit One Charge System Booster Pump Operability Testing	Revision 0

1R20 Refueling and Outage Activities

	Byron Station Technical Specifications	
	Byron/Braidwood Stations UFSAR	
	B1R11 Significant Issues List	
	Shift Manager’s Logs	March 16 & 17, 2002
Regulatory Guide 1.33	Quality Assurance Program Requirements	February 1978
NRC Bulletin 2001-01	Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles	August 3, 2001

RS-01-182	Exelon/AmerGen Response to NRC Bulletin 2001-01, “Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles”	August 31, 2001
	B1R11 Shutdown Safety Analysis for SSRB	March 4, 2002
CP-1A	Shutdown Safety analysis of Freeze for Replacement of 1AF017A	
CP-2A	Shutdown Safety Analysis of Freeze for Replacement of 1AF017B	
CP-3A	Shutdown Safety Analysis of Freeze for Replacement of 1CV8123	
CP-4A	Shutdown Safety Analysis of Freeze for Inspection of 1CV8378A/B	
CP-5A	Shutdown Safety Analysis of Freeze for Replacement of 1SI8818D	
CP-6A	Shutdown Safety Analysis Loss of DC Bus 111 from DC Bus 211 Crosstie	
CP-7A	Shutdown Safety Analysis Loss of DC Bus 112 from 212 Crosstie	
CP-12A	Shutdown Safety Analysis: Replacement of 1SX143B	
CP-13A	Shutdown Safety Assessment for the Replacement of 1/2SX001A and 1A SX Pump Overhaul	
CP-14A	Justification for Operating with a single Residual Heat Removal Train Available with the Upper Internals Installed following a Core Reload	
LS-AA-119	Overtime Controls	Revision 0
LS-AA-125	Corrective Action Program Procedure	Revision 2
CR 00099097	Unexplained Refuel Water Storage Tank Level Decrease Following Boron Dilution Protection System Actuation	March 12, 2002
CR 00099463	Loose Terminal Screw in Main Control Board	March 15, 2002
CR 00099519	Foreign Material Discovered in 1AF01PB-K After Removing PTO	March 16, 2002

CR 00099532	Crack Found in 1A Main Condenser North Wall During Inspection	March 14, 2002
CR 00099652 [1]	NRC questioned the use of “Clear Skin” Gloves in Foreign Material Exclusion Area Zone 1	March 17, 2002
CR 00099665	B1R11-Bus 143 Outage: Loss of Unit 2 Reactor Coolant Drain Tank Level Indication	March 18, 2002
CR 00099670	Wasted Engineering Time and Resources During Bus 143 Outage	March 18, 2002
CR 00099749	Internal Pipe Buildup in the Essential Service Water Inlet/Outlet to 1B Auxiliary Feedwater System	March 13, 2002
CR 00099785	1RY8010B Exceeds 1% “as found” Lift Setpoint	March 18, 2002
CR 00099832 [1]	Unplanned BOL-Entry 2PR28-Bus 143 Outage	March 18, 2002
CR 00100059	Possibly Multiple Missed LCOAR Entries	March 20, 2002
CR 00100065	Bus 143 Outage with Emergency Lighting Out-of-Service & No Temp Lighting	March 19, 2002
CR 00100201 [1]	Operations Department Has Not Written Condition Reports as Expected	March 20, 2002
CR 00100327	Summary of Bus 143 Outage Items during B1R11	March 21, 2002
CR 00100653	1CV8123 Seal Return Relief Valve Weeping	March 23, 2002
CR 00100697	Some Main Steam Isolation Valve Solenoid Mounting Screws 1/8" Shorter than Design	March 22, 2002
CR 00100795	Corrosion Identified on the Underside of the Reactor Vessel	March 24, 2002
CR 00100975 [1]	1B Steam Gnerator Primary Manway Hotleg Leaking	March 26, 2002
Generic Letter 88-17	Loss of Decay Heat Removal 10 CFR 50.54(f)	October 17, 1988
Generic Letter 88-17 Supplemental Information	Commonwealth Edison provided status on the implementation of Generic Letter 88-17	July 8, 1991

	List of Byron Station Corrective Maintenance Activities not Scheduled for B1R11	
1BGP 100-1	Plant Heatup	Revision 36
1BGP 100-1	Plant Heatup	Revision 37
1BGP 100-4 T1	Power Dissension Flow Chart	Revision 5
1BGP 100-5	Plant Shutdown and Cooldown	Revision 35
1BGP 100-5 T1	Plant Shutdown and Cooldown Flow Chart	Revision 16
1BGP 100-6	Refueling Outage	Revision 26
1BGP-100-6	Refueling Outage	Revision 27
BMP 3118-1	Reactor Vessel Closure Head Removal	Revision 18
BMP 3118-3	Reactor Vessel Upper Internals Removal	Revision 14
BMP 3118-5	Reactor Vessel Upper Internals Installation	Revision 12
BMP 3118-7	Reactor Vessel Closure Head Installation	Revision 18
BMP 3300-21	Unit 1 Steam Generator Primary Manway Closure Removal and Installation	Revision 4
1BOP AP-104	Bus 143 Outage While in Mode 5, 6 or Defueled	Revision 0
PORC 01-019	B1R11 Mode 4 Startup NSP (Process for Mode Change)	March 19, 2001
PORC 02-022	Reactor Vessel Staining Due to Reactor Cavity Boot Seal Leak	March 25, 2002
PORC 02-022	B1R11 Material Condition Readiness Review	March 25, 2002
OP-AA-101-102	Roles and Responsibilities of On-Shift Personnel	Revision 3
OP-AA-108-108	Unit Restart Review	Revision 0
ER-AA-330-001	Section XI Pressure Testing	Revision 0
HU-AA-1211	Pre-Job, Heightened Level of Awareness, Infrequent Plant Activity and Post-Job Briefings	Revision 0
Exelon Engineering Memo 1.02.1093	B1R11 Irradiated Fuel Inspection Summary Report	March 29, 2002

GL 82-12	Nuclear Power Plant Staff Working Hours	June 15, 1982
SY-AA-103-512	Continual Behavioral Observation Program	Revision 3
SY-AA-102	Exelon's Nuclear Fitness For Duty Program	Revision 5

1R22 Surveillance Testing

	Byron Station Technical Specifications	
	Byron/Braidwood Stations UFSAR	
	Shift Manager's Logs	March 12 & 13, 2002
1BOSR FW-SA1	Unit 1 Anticipated Transient Without SCRAM Mitigation System at Power Semiannual Surveillance	Revision 3
1BOSR Z.5.b.1-1	Unit 1 Containment Loose Debris Inspection	Revision 2
WO 00355773 01	U-1 Anticipated Transient Without SCRAM Mitigation System at Power Semiannual Surveillance	February 25, 2002
CR 00098912	Early Placement of Clear Order Delayed B1R11 SI Test	March 13, 2002
CR 00098961	Problems Encountered with Performance of 1BOSR 3.2.9-2	March 13, 2002
CR 00100975 [1]	1B Steam Generator Primary Manway Hotleg Leaking	March 26, 2002
1BOSR 3.2.9.2	Unit 1 Train B Manual Safety Injection and Manual Phase A Initiation Surveillance	Revision 9
1BOSR 8.1.9.2	1B Diesel Generator Safe Shutdown Sequencer and Single Load Rejection Test	Revision 0
AR 099589	0B Control Room Heating, Ventilation and Air Conditioning System (VC) Chiller Unplanned LCOAR Entry	March 18, 2002
AR 100051	Missed Reading on 0B VC during Performance of 1BOSR 8.1.9.2	March 20, 2002
1BOSR 6.3.6-1	Unit One Primary Containment Type C Local Leakage Rate Tests of Containment Miniflow Purge Isolation Valves	Revision 4

1BOSR 6.3.6-12	Primary Containment Type C Local Leakage Rate Tests and Inservice Inspection Tests of Component Cooling System	Revision 4
1BOSR 8.1.17.2	1B Diesel Generator Sequencer Test - 18 Month	Revision 0
1BOSR 8.1.11.2	1B Diesel Generator Safe Shutdown Sequencer	Revision 0
1BOSR 3.2.9-2	Unit 1 Train B Manual Safety Injection Initiation and Manual Phase A Initiation Surveillance	Revision 9 performed March 12 through 23, 2002
Clearance Order 0004617	Pen Elec E42 Channel 2 Nuclear Instrument 1-3353 RXB1+9	
	Outage Management and Services Predecessor View for Clearance Order 0004617	
Regulatory Guide 1.33	Quality Assurance Program Requirements	February 1978
NUREG 1020	Events Reporting Guidelines 10 CFR 50.72 and 73	Revision 2
OP-AA-101-201	Station Equipment Clearance and Tagging	Revision 6
OP-AA-101-102	Roles and Responsibilities of On-Shift Personnel	Revision 3

1R23 Temporary Plant Modifications

	Byron Station TS	
	Byron/Braidwood Stations UFSAR	
CR 00096652	Inconsistencies in [containment] Chiller Operation Between Byron and Braidwood	December 31, 2001
CR 00098118	U-1 Main Steam Supports Found Damaged in MS Tunnel	March 06, 2002
CR 00100400	SD Sample Return per BOP SD-102 T-Mod Not Complete	March 21, 2002
EC 335829	Installation of Temporary Pipe Supports for Main Steam Line 1MS01CC-32 3/4	Revision 0

BOP SD-102	Operation of the Steam Generator Blowdown Sample Return Subsystem	Revision 2
Proposed Recommendation	Operation of the Containment Ventilation System without Containment Chillers	

2OS1 Access Control to Radiologically Significant Areas

	Facilitator Guide for Initial Radiation Worker Training: Protective Clothing Demo	Revision 1
BRP 5000-7	Unescorted Access To and Conduct in Radiologically Posted Areas	Revision 10
BRP 6020-3	Routine Plant Surveys	Revision 17
CR 00098750	Radiation Protection Survey Weakness	March 7, 2002
CR 00098901	Worker Dropped Digi and Lost Thermoluminescent Dosimeter	March 15, 2002
CR 00099212	Rad Worker Not Furnished Dose Rate Instrument (Laundry Pickup)	March 14, 2002
CR 00099560 [1]	Radiation Protection Informational Posting Difficult to Read	March 16, 2002
CR 00099598 [1]	Poor Radiation Worker Practices During B1R11	March 17, 2002
CR 00100149 [1]	MGPAC Does Not Lock Out Individuals on Dose Rate Alarm	March 20, 2002
RWP 10000556	B1R11 - Tours and Insp - All RCAs (Aux, Cnmt IMB/OMB, Outside)	Revision 0

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

	Byron Station ALARA Unit 1 Containment Baseline Dose Rates	March 16, 2002
	Daily Station Dose by RWP Number Report (TE008) (for RWP Nos. 10000557 - 10000565) SR12 - Predecessor/Successor Analysis Report for RP Shielding and Flushing Activities	March 18, 2002
ALARA Work in Progress Review	RWP No. 10000558, Stage and Remove S/G Equipment in Aux. Building and U-1 Containment Including Decon Tent Activities	March 16, 2002

ALARA Work in Progress Review	RWP No. 10000560, Manway and Diaphragm Removal/Installation and Stud Hole Cleaning	March 16, 2002
ALARA Work in Progress Review	RWP No. 10000573, Misc. AOV Work	March 18, 2002
BRP 5310-1	Hot Spot Tracking System	Revision 8
CR 00076318	Source Term Reduction Program/Hot Spot Surveys Not Done	September 25, 2001
CR 00097134	RP Focused Area Self-Assessment Outage Readiness and ALARA Issues	February 8, 2002
CR00097258	Improvement for Radiation Protection Pre-Job Briefs	February 26, 2002
CR 00098396	Laborer Dose Estimate 37 mr Over Initial Estimate for 3/7/02	March 7, 2002
CR 00098398	Aux Building Scaffold Exposure Estimate Exceeded, Venture	March 4, 2002
CR 00100011[1]	Weakness Identified in Source Term Reduction Program	March 19, 2002
Focus Area Self-Assessment Report No. 2002-002	ALARA Program and Outage Readiness and Preparation	February 7-8, 2002
HU-AA-1211	Pre-Job, Heightened Level of Awareness, Infrequent Plant Activity and Post-Job Briefs	Revision 0
RWP/ALARA Plan No. 10000558	Stage and Remove Steam Generator Equipment in Aux. Building and Unit 1 Containment Including Decon Tent Activities	Revision 1
RWP/ALARA Plan No. 10000560	Manway and Diaphragm Removal/Installation and Stud Hole Cleaning	Revision 0
RWP/ALARA Plan No. 10000562	Install/Remove SG Nozzle Covers, Complete SG Bowl Closeout	Revision 0
RWP/ALARA Plan No. 10000563	SG Eddy Current Testing, Tube Repairs, and Inspections	Revision 2
RWP/ALARA Plan No. 10000564	Remove/Install Secondary Side Covers and Inspection Port Covers. Perform Sludge Lance Activities and Inspection(s). FOSAR (Foreign Object Search and Retrieval)	Revision 3

RWP/ALARA Plan No. 10000573	Miscellaneous Aor Operated Valve Work: Including Operator and Process Diaphragm Work	Revision 0
RWP/ALARA Plan No. 10000576	Reactor Head Disassembly/Re-assembly, Including Lift Prep, Cleaning Studs, Cono-Seal/RVLIS Removal and Installation	Revision 0
Survey No. 01-3104	330' - 346' Els. Hot Spots	January 25, 2001
Survey No. 01-3119	Hot Spot Survey 364 A.B.	January 25, 2001
Survey No. 01-3041	AB-364 Unit 1 Penetration Area (including Hot Spot Nos. 8 and 64)	January 9, 2001
Survey No. 01-3180	AB-364 Unit 1 Penetration Area (including Hot Spot Nos. 8 and 64)	February 7, 2001
TEDE Eval No. 02-06	Diaphragm Removal/Replacement (RWP No. 10000560)	March 5, 2002
TEDE Eval No. 02-08	Half Jumps into Steam Generator Bowl (RWP Nos. 10000562 and 10000563)	March 6, 2002
TEDE Eval No. 02-09	Work on Platforms, >300k but < 1000k contamination levels (RWP Nos. 10000560 and 10000563)	March 5, 2002
TEDE Eval No. 02-10	Work on the Platforms, >1000k contamination levels. Eddy Current Workers (RWP No. 10000563)	March 6, 2002

4OA3 Event Followup

50-454-2001-003-00	Entry into Technical Specification Limiting Condition for Operation 3.0.3 Due to a Leak on a Safety Injection Valve Weld Caused by a Pre-existing Condition and Failing to Use Correct Work Scope Revision Process	November 26, 2001
50-454-2001-003- 01	Entry into Technical Specification Limiting Condition for Operation 3.0.3 Due to a Leak on a Safety Injection Valve Weld Caused by a Pre-existing Condition and Failing to Use Correct Work Scope Revision Process, Supplement 1	January 28, 2002

4OA5 Other

RS-01-182	Exelon/AmerGen Response to NRC Bulletin 2001-01, “Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles”	August 31, 2001
NRC Bulletin 2001-01	Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles, Responses for Byron Station, Units 1 and 2 and Braidwood Station, Units 1 and 2	November 14, 2001
CR 0009845	DG 14 Day Completion Time May No Longer Be Valid	March 8, 2002

[1] Condition Report written as a result of the inspection.