



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
2443 WARRENVILLE ROAD, SUITE 210  
LISLE, IL 60532-4352

August 7, 2009

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

**SUBJECT: BYRON STATION, UNITS 1 AND 2 INTEGRATED INSPECTION  
REPORT 05000454/2009003; 05000455/2009003**

Dear Mr. Pardee:

On June 30, 2009, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Byron Station, Units 1 and 2. The enclosed inspection report documents the inspection findings which were discussed on July 8, 2009, with D. Enright and other members of your staff.

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

Based on the results of this inspection, one NRC-identified finding of very low safety significance was identified. The finding involved a violation of NRC requirement. Additionally, licensee identified violations which were determined to be of very low safety significance are listed in Section 4OA7 of this report. However, because of their very low safety significance, and because the issues were entered into your corrective action program, the NRC is treating the issues as non-cited violations (NCVs) in accordance with Section VI.A.1 of the NRC Enforcement Policy.

If you contest the subject or severity of a Non-Cited Violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission - Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector Office at the Byron Station. In addition, if you disagree with the characterization of any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region III, and the NRC Resident Inspector at Byron Station. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

*/RA/*

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

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

Enclosure: Inspection Report No. 05000454/2009-003  
and 05000455/2009-003  
w/Attachment: Supplemental Information

cc w/encl: Site Vice President - Byron Station  
Plant Manager - Byron Station  
Manager Regulatory Assurance - Byron Station  
Senior Vice President - Midwest Operations  
Senior Vice President - Operations Support  
Vice President - Licensing and Regulatory Affairs  
Director - Licensing and Regulatory Affairs  
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Illinois Emergency Management Agency  
J. Klinger, State Liaison Officer,  
Illinois Emergency Management Agency  
P. Schmidt, State Liaison Officer, State of Wisconsin  
Chairman, Illinois Commerce Commission  
B. Quigley, Byron Station

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05000454/2009-003; 05000455/2009-003

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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report Nos: 05000454/2009003 and 05000455/2009003

Licensee: Exelon Generation Company, LLC

Facility: Byron Station, Units 1 and 2

Location: Byron, IL

Dates: April 1, 2009, through June 30, 2009

Inspectors: B. Bartlett, Senior Resident Inspector  
J. Robbins, Resident Inspector  
J. Cassidy, Senior Health Physicist  
A. Garmoe, Braidwood Resident Inspector  
R. Ng, Project Engineer  
M. Phalen, Health Physicist  
C. Thompson, Resident Inspector, Illinois Department of  
Emergency Management

Observer: J. Dalzell

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

Enclosure

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## SUMMARY OF FINDINGS

IR 05000454/2009-003, 05000455/2009-003; April 01, 2009 – June 30, 2009; Byron Station, Units 1 & 2; Operability Evaluations.

This report covers a 3-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. One Green finding was identified by the inspectors. The finding was considered a Non-Cited Violation of NRC regulations. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

### A. NRC-Identified and Self-Revealed Findings

#### Cornerstone: Initiating Event

- Green. A finding of very low safety significance and associated Non-Cited Violation of Technical Specification 3.4.13.B was identified by the NRC inspectors on June 24, 2009, when reactor coolant pressure boundary leakage was identified on a Unit 2 process sampling line and the licensee continued to operate the unit but did not repair or isolate the leak within the Technical Specification Limiting Condition for Operation requirement of 6 hours. The licensee entered this issue into the corrective action program and replaced the leaking section of pipe.

The inspectors concluded that the finding was greater than minor in accordance with Appendix E, Example 2a, of IMC 0612, regarding situations when Technical Specification limits were exceeded. The finding was determined to be of very low safety significance after an SDP Phase 2 evaluation. The issue had been entered into the licensee's corrective action program as Issue Report (IR) 934800. The primary cause for this finding was related to the cross-cutting area of Human Performance and its associated component for Decision Making (H.1(b)) because licensee management personnel concluded that this leak did not represent reactor coolant pressure boundary leakage due to the closure of an isolation valve. (Section 1R15)

### B. Licensee-Identified Violations

Violations of very low safety significance that were identified by the licensee have been reviewed by inspectors. Corrective actions planned or taken by the licensee have been entered into the licensee's corrective action program. These violations and corrective action tracking numbers are listed in Section 4OA7 of this report.

## **REPORT DETAILS**

### **Summary of Plant Status**

Unit 1 operated at or near full power throughout the inspection period with one exception. On June 4, 2009, power was reduced to 89.7 percent for maintenance activities on the position indicator for turbine governor valve Number 4. Power was restored to 100 percent the following day.

Unit 2 operated at or near full power throughout the inspection period with two exceptions. On April 25, 2009, power was reduced by 200 MWe in response to an urgent request from the grid operator. Power was restored to 100 percent the next day. On June 18, 2009, power was reduced to 90 percent and then to 80 percent on June 19, 2009, in response to requests from the grid operator. Power was restored to 100 percent the following day.

### **1. REACTOR SAFETY**

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

#### **1R01 Adverse Weather Protection (71111.01)**

##### **.1 Readiness of Offsite and Alternate Alternating Current (AC) Power Systems**

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

The inspectors verified that plant features and procedures for operation and continued availability of offsite and alternate AC power systems during adverse weather were appropriate. The inspectors reviewed the licensee's procedures affecting these areas and the communications protocols between the transmission system operator (TSO) and the plant to verify that the appropriate information was being exchanged when issues arose that could impact the offsite power system. Examples of aspects considered in the inspectors' review included:

- The coordination between the TSO and the plant during off-normal or emergency events;
- The explanations for the events;
- The estimates of when the offsite power system would be returned to a normal state; and
- The notifications from the TSO to the plant when the offsite power system was returned to normal.

The inspectors also verified that plant procedures addressed measures to monitor and maintain availability and reliability of both the offsite AC power system and the onsite alternate AC power system prior to or during adverse weather conditions. Specifically, the inspectors verified that the procedures addressed the following:

- The actions to be taken when notified by the TSO that the post-trip voltage of the offsite power system at the plant would not be acceptable to assure the continued operation of the safety-related loads without transferring to the onsite power supply;
- The compensatory actions identified to be performed if it would not be possible to predict the post-trip voltage at the plant for the current grid conditions;
- A re-assessment of plant risk based on maintenance activities that could affect grid reliability, or the ability of the transmission system to provide offsite power; and
- The communications between the plant and the TSO when changes at the plant could impact the transmission system, or when the capability of the transmission system to provide adequate offsite power was challenged.

Specific documents reviewed during this inspection are listed in the Attachment. The inspectors also reviewed Corrective Action Program (CAP) items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their CAP in accordance with station corrective action procedures.

This inspection constitutes one readiness of offsite and alternate AC power systems sample as defined in Inspection Procedure (IP) 71111.01-05.

b. Findings

No findings of significance were identified.

.2 Summer Seasonal Readiness Preparations

a. Inspection Scope

The inspectors performed a review of the licensee's preparations for summer weather for selected systems, including conditions that could lead to an extended drought as a result of high temperatures.

During the inspection, the inspectors focused on plant specific design features and the licensee's procedures used to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. Specific documents reviewed during this inspection are listed in the Attachment. The inspectors also reviewed CAP items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their CAP in accordance with station corrective action procedures. The inspectors' reviews focused specifically on the following plant systems:

- Switchyard; and
- Non-Essential Service Water.

This inspection constitutes one seasonal adverse weather sample as defined in IP 71111.01-05.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

The inspectors performed a partial system walkdown of the following risk-significant system:

- Unit 1 Train B Diesel Fuel Oil while Unit 1 Train A Diesel Generator was out-of-service.

The inspectors selected this system based on its risk significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could impact the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, UFSAR, Technical Specification (TS) requirements, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment.

These activities constituted one partial system walkdown sample as defined in IP 71111.04-05.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

The inspectors conducted fire protection walkdowns which were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- Division 11 Misc. Electrical Equipment and Battery Room (Zone 5.6-1);
- Unit 1 Electrical Penetration Area (Zone 11.5A-1);
- Unit 2 Electrical Penetration Area (Zone 11.5A-2);
- Unit 1 Train B Diesel Fuel Oil Storage Tank Room (Zone 10.1-1); and
- Unit 1 Train B Diesel Generator and Day Tank Room (Zone 9.1-1).

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, maintained passive fire protection features in good material condition, and had implemented adequate compensatory measures for out-of-service, degraded, or inoperable fire protection equipment, systems, or features in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the Attachment, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed, that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's CAP. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings of significance were identified.

1R06 Flooding (71111.06)

.1 Internal Flooding

a. Inspection Scope

The inspectors reviewed selected risk important plant design features and licensee procedures intended to protect the plant and its safety-related equipment from internal flooding events. The inspectors reviewed flood analyses and design documents, including the UFSAR, engineering calculations, and abnormal operating procedures to identify licensee commitments. The specific documents reviewed are listed in the Attachment to this report. In addition, the inspectors reviewed licensee drawings to identify areas and equipment that may be affected by internal flooding caused by the failure or misalignment of nearby sources of water, such as the fire suppression or the circulating water systems. The inspectors also reviewed the licensee's corrective action documents with respect to past flood-related items identified in the corrective action program to verify the adequacy of the corrective actions. The inspectors performed a walkdown of the following plant areas to assess the adequacy of watertight doors and verify drains and sumps were clear of debris and were operable, and that the licensee complied with its commitments:

- AB - 346' Elevation - SX piping in the General Area; and
- AB - 330' Elevation - SX Pump Rooms.

This inspection constituted two internal flooding samples as defined in IP 71111.06-05.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Regualification Program (71111.11)

.1 Resident Inspector Quarterly Review (71111.11Q)

a. Inspection Scope

On May 6, 2009, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator requalification examinations to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- licensed operator performance;
- crew's clarity and formality of communications;
- ability to take timely actions in the conservative direction;
- prioritization, interpretation, and verification of annunciator alarms;
- correct use and implementation of abnormal and emergency procedures;
- control board manipulations;
- oversight and direction from supervisors; and
- ability to identify and implement appropriate TS actions and Emergency Plan actions and notifications.

The crew's performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one quarterly licensed operator requalification program sample as defined in IP 71111.11.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations (71111.12Q)

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk significant systems:

- Unit 2 Bus 211 Grounding Issues;
- Unit 1 and Unit 2 Boric Acid System Degraded Boric Acid Tank Liners;
- Unit 1 and Unit 2 Main Power System Classified as (a)(1) Under Maintenance Rule; and
- Unit 2 Train B Station Air System due to Multiple Trip Events.

The inspectors reviewed events such as where ineffective equipment maintenance had resulted in valid or invalid automatic actuations of engineered safeguards systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- implementing appropriate work practices;
- identifying and addressing common cause failures;
- scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring;
- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- verifying appropriate performance criteria for structures, systems, and components (SSCs)/functions classified as (a)(2) or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

This inspection constituted four quarterly maintenance effectiveness samples as defined in IP 71111.12-05.

b. Findings

No findings of significance were identified.

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

.1 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the licensee's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- 0A Main Control Room Ventilation Train Loss of Control Room Differential Pressure;
- Unit 1 Train A Diesel Generator out of service while Unit 2 Station Auxiliary Transformer 242-1 was out of service;

- Unit 2 Auxiliary Feedwater Flow Control Valves Failed Open for Calibration while Unit 1 Essential Service Water (SX) Return Header Isolation Valve and Unit 0 Component Cooling Heat Exchanger Isolation Valve were out-of-service (OOS);
- Unit 1 Train B Diesel Generator out of service while Unit 1 Train A SX Suction Isolation Valve was unable to close;
- Unit Common 0SX10BA Piping, Possible Thru Wall Leak; and
- Unit 1 Condenser Piping Leak that was not Isolable.

These activities were selected based on their potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4) and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed TS requirements and walked down portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- Unit 1 Train B Auxiliary Feedwater Gear Box and Right Angle Gear Drive High Vibrations;
- Unit 1 Nuclear Instrument Power Range Different than Computer Calorimetric;
- Movement of a Heavy Load over the Dry Cask in the Cask Loading Pit;
- Assessment of the Diesel Oil Storage Tank Vents being Non-Seismic and Non-Tornado Proof;
- Assessment of Bus 211 Operability due to Grounding Issues;
- Unit 1 Circulating Water Piping Leak;
- Unit 1 Reactor Coolant System Pressure Boundary Leakage;
- Pressurizer Powered Operated Relief Valve Accumulator 2A Low Pressure Alarm; and
- Essential Service Water Make Up Pump 0A Discharge Check Valve Leakage.

The inspectors selected these potential operability issues based on the risk-significance of the associated components and systems. The inspectors evaluated the technical

adequacy of the evaluations to ensure that TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TS and UFSAR to the licensee's evaluations, to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors also reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment to this report.

This operability inspection constituted nine samples as defined in IP 71111.15-05.

b. Findings

(1) Failure to Comply with Technical Specifications Regarding Reactor Coolant Pressure Boundary (RCPB) Leakage

Introduction: A finding of very low significance (Green) and an associated NCV of TS 3.4.13.B was identified by the NRC inspectors on June 26, 2009, when RCPB leakage was identified but not repaired or isolated within the TS Limiting Condition for Operation requirement of 6 hours.

Description: On June 24, 2009, during a routine containment entry at power, licensee personnel identified a pinhole leak (one drop every 5 minutes) on a welded connection inside the Unit 2 containment (IR 934800). The welded connection is on line 2PS01BB and the line is 3/8 inch in diameter. This line is a pressurizer liquid sample line and is a non-safety related non-American Society of Mechanical Engineer (ASME) code, class D pipe. The licensee verified that valve 2PS9350B upstream of the leak was closed and that both containment isolation valves downstream of the leak were closed. Based on the upstream valve being closed and in the Shift Manager's opinion being isolated, and with the remaining leakage being not significant, the leak was not considered by licensee personnel to be RCPB leakage.

10 CFR 50.2, defines RCPB as "... all those pressure-containing components of boiling and pressurized water-cooled nuclear power reactors, such as pressure vessels, piping, ... which are ...connected to the reactor coolant system, up to and including any and all of the following ... The outermost containment isolation valve in system piping which penetrated primary reactor containment...." TS 1.1 define pressure boundary leakage as "LEAKAGE (except primary to secondary LEAKAGE) through a nonisolable fault in an RCS component body, pipe wall, or vessel wall."

The portion of the line with the through wall leak is a part of the RCPB as the line is connected to the pressurizer, which is a part of the reactor coolant system (RCS) and was located before the innermost containment isolation valve. Though isolation valve 2PS9350B was closed, the leakage out of the pipe continued which demonstrated that the isolation valve was leaking by and the leak was not fully isolated. As such, there was a fault through a RCS component pipe wall which was not isolable. Technical

Specification 3.4.13.B had an allowable value of “No pressure boundary LEAKAGE” with a requirement that if pressure boundary leakage existed to be in Mode 3 within 6 hours.

The NRC inspectors consulted regional management and headquarters personnel related to this issue. On June 26, 2009 at 4:30 p.m., the licensee was informed that in NRC’s opinion, the leak was RCPB leakage and that TS 3.4.13.B should have been entered. The licensee acknowledged the NRC opinion and immediately entered TS 3.4.13.B.

The licensee had begun repair efforts earlier in the day on June 26, 2009. The repair was completed; post maintenance testing was performed and the licensee exited the TS at 8:07 p.m. on June 26.

The inspectors determined by a review of the records that licensee personnel exited Unit 1 containment on June 24, 2009, at 1:41 p.m. Using that time as the start time, the inspectors calculated that it took the licensee 55 hours and 26 minutes to repair the pipe and to exit the TS. This was 49 hours and 26 minutes over the 6 hour TS requirement.

Analysis: The inspectors determined that the licensee’s failure to comply with TS 3.4.13.B was a performance deficiency warranting a significance evaluation. The inspectors concluded that the issue was more than minor in accordance with Appendix E, Example 2a, of Inspection Manual Chapter (IMC) 0612 regarding situations when Technical Specification limits were exceeded.

The inspectors performed a significance determination process (SDP) of this issue using IMC 0609, Attachment IMC 0609.04. The inspectors determined the finding fell under the Initiating Events Cornerstone as a primary system loss of coolant accident initiator. However, it did not represent a transient initiator contributor, did not represent a fire initiator contributor, and was not an internal/external flooding initiator contributor. The inspectors determined that, assuming the worst case degradation, the finding could result in exceeding the TS limit for RCS leakage. This is because the TS limit for RCPB leakage is zero and the actual leakage was one drop every 5 minutes. The inspectors then performed a Phase 2 SDP using the risk informed inspection notebook. The Phase 2 result was green.

The primary cause of this finding was related to the cross-cutting area of Human Performance for Decision Making (H.1(b)) because licensee management personnel concluded that this leak did not represent RCPB leakage as the isolation valve was closed, even though it was known to have slight leak-by and determined that TS 3.4.13.B was not required to be entered.

Enforcement: Technical Specification 3.4.13.B requires that there be no RCPB leakage. If RCPB leakage exists, the licensee is required to repair the leak or to shutdown and be in Mode 3 within 6 hours. Contrary to this requirement, starting on June 24, 2009, Unit 2 had through pipe wall RCPB leakage and the licensee did not repair or shut down the leak for 55 hours and 26 minutes. Because of the very low safety significance of the issue and because the issue has been entered into the licensee’s CAP (IR 934800); the issue is being treated as an NCV, consistent with Section VI.A.1, of the NRC Enforcement Policy. **(NCV 05000455/2009003-01)**

(2) Diesel Oil Storage Tank Vents Being Non-Seismic and Non-Tornado Proof

No findings of significance were identified regarding this issue, however, a related unresolved item is described in Section 40A5.1 of this report.

1R18 Plant Modifications (71111.18)

.1 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the following temporary modifications:

- Unit 2 Engineering Change 375313 Plugging of Gland Steam Leak on High Pressure Turbine; and
- Unit 1 Train B Auxiliary Feedwater Gear Box and Right Angle Gear Drive High Vibrations.

The inspectors compared the temporary configuration changes and associated 10 CFR 50.59 screening and evaluation information against the design basis, the UFSAR, and the TS, as applicable, to verify that the modification did not affect the operability or availability of the affected systems. The inspectors also compared the licensee's information to operating experience information to ensure that lessons learned from other utilities had been incorporated into the licensee's decision to implement the temporary modification. The inspectors, as applicable, performed field verifications to ensure that the modifications were installed as directed; the modifications operated as expected; modification testing adequately demonstrated continued system operability, availability, and reliability; and that operation of the modifications did not impact the operability of any interfacing systems. Lastly, the inspectors discussed the temporary modification with operations, engineering, and training personnel to ensure that the individuals were aware of how extended operation with the temporary modification in place could impact overall plant performance. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19)

.1 Post-Maintenance Testing

a. Inspection Scope

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

- Unit 2 Train B Diesel Driven Auxiliary Feedwater Pump Start Sequence Test following Maintenance;
- Pressurizer Liquid Space Sample Line Through Wall Leak Repair Leak Test;
- Unit 2 Train B Solid State Protection System Surveillance following Corrective Maintenance;
- Unit 1 Essential Service Water Return Isolation Valve (1SX010) Test following Breaker Work;
- Unit 1 Containment Spray System Test following Repair of 1SX091A;
- Unit 1 Train A Diesel Generator Test following Turning Gear Maintenance; and
- SX Makeup Pump Test following Level Switch Replacement.

These activities were selected based upon the structure, system, or component's ability to impact risk. The inspectors evaluated these activities for the following (as applicable): the effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed; acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate; tests were performed as written in accordance with properly reviewed and approved procedures; equipment was returned to its operational status following testing (temporary modifications or jumpers required for test performance were properly removed after test completion), and test documentation was properly evaluated. The inspectors evaluated the activities against TS, the UFSAR, 10 CFR 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with post-maintenance tests to determine whether the licensee was identifying problems and entering them in the CAP and that the problems were being corrected commensurate with their importance to safety. Documents reviewed are listed in the Attachment to this report.

This inspection constituted seven post-maintenance testing samples as defined in IP 71111.19-05.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

.1 Surveillance Testing

a. Inspection Scope

The inspectors reviewed the test results for the following activities to determine whether risk-significant systems and equipment were capable of performing their intended safety function and to verify testing was conducted in accordance with applicable procedural and TS requirements:

- Calibration of Reactor Coolant Pump Seal Water Injection Flow Loop (Routine);
- Unit 1 Train B Diesel Generator Operability Semi-Annual Surveillance (Routine);
- Unit 1 Auxiliary Feedwater Isolation Valve Stroke Time Testing (IST);
- Unit 1 Train B Auxiliary Feedwater Pump, Monthly Surveillance (Routine);

- Unit 2 Diesel Driven Auxiliary Feedwater Pump Monthly Surveillance, 2BOSR 7.5.4-2, Revision 16 (Routine); and
- Unit 2 Steam Generator Blowdown Containment Isolation Valve Stroke Time Testing (IST).

The inspectors observed in plant activities and reviewed procedures and associated records to determine some of the following:

- did preconditioning occur;
- were the effects of the testing adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- were acceptance criteria clearly stated, demonstrated operational readiness, and consistent with the system design basis;
- plant equipment calibration was correct, accurate, and properly documented;
- as-left setpoints were within required ranges; and the calibration frequency were in accordance with TSs, the UFSAR, procedures, and applicable commitments;
- measuring and test equipment calibration was current;
- test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied;
- test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used;
- test data and results were accurate, complete, within limits, and valid;
- test equipment was removed after testing;
- where applicable for inservice testing activities, testing was performed in accordance with the applicable version of Section XI, American Society of Mechanical Engineers code, and reference values were consistent with the system design basis;
- where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable;
- where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure;
- where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished;
- prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test;
- equipment was returned to a position or status required to support the performance of its safety functions; and
- all problems identified during the testing were appropriately documented and dispositioned in the CAP.

Documents reviewed are listed in the Attachment to this report.

This inspection constituted four routine surveillance testing samples, and two inservice testing samples, as defined in IP 71111.22, Sections -02 and -05.

b. Findings

No findings of significance were identified.

**Cornerstone: Emergency Preparedness**

1EP6 Drill Evaluation (71114.06)

.1 Training Observation

a. Inspection Scope

The inspector observed a simulator training evolution for licensed operators on June 18, 2009, which required emergency plan implementation by a licensee operations crew. This evolution was planned to be evaluated and included in performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crew. The inspectors also attended the post-evolution critique for the scenario. The focus of the inspectors' activities was to note any weaknesses and deficiencies in the crew's performance and ensure that the licensee evaluators noted the same issues and entered them into the corrective action program. As part of the inspection, the inspectors reviewed the scenario package and other documents listed in the Attachment to this report.

This training inspection constituted one sample as defined in IP 71114.06-05.

b. Findings

No findings of significance were identified.

**2. RADIATION SAFETY**

**Cornerstone: Occupational Radiation Safety**

2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03)

.1 Inspection Planning and Identification of Instrumentation

a. Inspection Scope

The inspectors reviewed the licensee's UFSAR to identify applicable radiation monitors associated with measuring transient high and very high radiation areas, including those intended for remote emergency assessment. The inspectors identified the types of portable radiation detection instrumentation that were used for job coverage of high radiation area work, including instruments for underwater surveys, portable and fixed area radiation monitors that were used to provide radiological information in various plant areas, and continuous air monitors that were used to assess airborne radiological conditions and work areas with the potential for workers to receive a 50 millirem or greater committed effective dose equivalent (CEDE). Whole body counters that were used to monitor for internal exposure and those radiation detection instruments that were used to conduct surveys for the release of personnel and equipment from the

radiologically controlled area (RCA), including contamination monitors and portal monitors, were also identified.

This inspection constituted two samples as defined in IP 71121.03-5.

b. Findings

No findings of significance were identified.

.2 Calibration and Testing of Radiation Monitoring Instrumentation

a. Inspection Scope

The inspectors reviewed radiological instrumentation to determine if it had been calibrated as required by the licensee's procedures, consistent with industry and regulatory standards. The inspectors also reviewed alarm setpoints for selected instruments to determine whether they were established consistent with the UFSAR or TS, as applicable, and with industry practices and regulatory guidance. Specifically, the inspectors reviewed calibration procedures and the most recent calibration records for the following radiation monitoring instrumentation and calibration equipment:

- Personnel Contamination Monitors;
- Shepard Calibrator;
- Telepoles;
- Ion Chambers; and
- Air Samplers.

The inspectors determined what actions were taken when, during calibration or source checks, an instrument was found significantly out of calibration or exceeded as-found acceptance criteria. Should that occur, the inspectors determined whether the licensee's actions would include a determination of the instruments previous uses and the possible consequences of that use since the prior successful calibration. The inspectors also reviewed the results of the licensee's most recent 10 CFR 61 source term (radionuclide mix) evaluations to determine if the radiation sources that were used for instrument calibration and for instrument checks were representative of the plant source term.

The inspectors observed the licensee's use of the portable survey instrument calibration units, discussed calibrator output validation methods, and compared calibrator exposed readings with calculated/expected values. The inspectors evaluated compliance with licensee procedures while radiation protection (RP) personnel demonstrated the methods for performing source checks of portable survey instruments and source checks of personnel contamination and portal monitors.

This inspection constituted one sample as defined in IP 71121.03-5.

b. Findings

No findings of significance were identified.

### .3 Problem Identification and Resolution

#### a. Inspection Scope

The inspectors reviewed licensee corrective action program documents and any Licensee Event Reports or special reports that involved personnel contamination monitor alarms due to personnel internal exposures to determine whether identified problems were entered into the corrective action program for resolution.

While no internal exposure with a CEDE greater than 50 millirem occurred since the last inspection in this area, the inspectors reviewed the licensee's methods for internal dose assessment to determine if affected personnel would be properly monitored using calibrated equipment and if the data would be analyzed and exposures properly assessed.

This inspection constituted one sample as defined in IP 71121.03-5.

The inspectors reviewed corrective action program reports related to exposure significant radiological incidents that involved radiation monitoring instrument deficiencies since the last inspection in this area, as applicable. Members of the RP staff were interviewed and corrective action documents were reviewed to determine whether follow-up activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk based on the following:

- Initial problem identification, characterization, and tracking;
- Disposition of operability/reportability issues;
- Evaluation of safety significance/risk and priority for resolution;
- Identification of repetitive problems;
- Identification of contributing causes;
- Resolution of NCVs tracked in the corrective action system; and
- Identification and implementation of effective corrective actions.

This inspection constituted one sample as defined in IP 71121.03-5.

The inspectors determined if the licensee's self-assessment and audit activities completed for the approximate 2-year period that preceded the inspection were identifying and addressing repetitive deficiencies or significant individual deficiencies in problem identification and resolution, as applicable.

This inspection constituted one sample as defined in IP 71121.03-5.

#### b. Findings

No findings of significance were identified.

### .4 Radiation Protection Technician Instrument Use

#### a. Inspection Scope

The inspectors verified that calibrations for those survey instruments used to perform job coverage surveys and for those currently designated for use had not lapsed. The

inspectors determined if response checks of portable survey instruments and checks of instruments used for unconditional release of materials and workers from the RCA were completed prior to instrument use, as required by the licensee's procedure. The inspectors also discussed instrument calibration methods and source response check practices with RP staff and observed staff demonstrate instrument source checks.

This inspection constituted one sample as defined in IP 71121.03-5.

b. Findings

No findings of significance were identified.

.5 Self-Contained Breathing Apparatus Maintenance/Inspection and Emergency Response Staff Qualifications

a. Inspection Scope

The inspectors reviewed the status and surveillance records of self-contained breathing apparatus (SCBAs) that were staged in the plant and ready-for-use and evaluated the licensee's capabilities for refilling and transporting SCBA air bottles to-and-from the control room and operations support center during emergency conditions. The inspectors determined if control room staff and other emergency response and RP personnel were trained, respirator fit tested, and medically certified to use SCBAs, including personal bottle change-out. Additionally, the inspectors reviewed SCBA qualification records for numerous members of the licensee's radiological emergency teams to determine if a sufficient number of staff were qualified to fulfill emergency response positions, consistent with the licensee's emergency plan and the requirements of 10 CFR 50.47.

This inspection constituted one sample as defined in IP 71121.03-5.

The inspectors reviewed the qualification documentation for at least 50 percent of the onsite, or as applicable, offsite contract personnel that performed maintenance on manufacturer designated vital SCBA components. The inspectors also reviewed vital component maintenance records for several SCBA units that were designated as ready-for-use. The inspectors also evaluated, through record review and observations, if the required air cylinder hydrostatic testing was documented and current and if the Department of Transportation required retest air cylinder markings were in place for several randomly selected SCBA units and spare air bottles. The inspectors reviewed the onsite maintenance procedures governing vital component work, as applicable, including those for the low-pressure alarm and pressure-demand air regulator. The inspectors reviewed the licensee's maintenance procedures and the SCBA manufacturer's recommended practices to determine if there were any inconsistencies between them.

This inspection constituted one sample as defined in IP 71121.03-5.

b. Findings

No findings of significance were identified.

## **Cornerstone: Public Radiation Safety**

### 2PS1 Radioactive Gaseous And Liquid Effluent Treatment And Monitoring Systems (71122.01)

#### .1 Inspection Planning

##### a. Inspection Scope

The inspectors reviewed the configuration of the licensee's gaseous and liquid effluent processing systems to confirm that radiological discharges were properly mitigated, monitored, and evaluated with respect to public exposure. The inspectors reviewed the performance requirements contained in General Design Criteria 60 and 64 of Appendix A to 10 CFR Part 50 and in the licensee's Radiological Effluent Technical Specifications (RETS) and Offsite Dose Calculation Manual (ODCM). The inspectors also reviewed any abnormal radioactive gaseous or liquid discharges and any conditions since the last inspection when effluent radiation monitors were out-of-service to verify that the required compensatory measures were implemented. Additionally, the inspectors reviewed the licensee's quality control program to verify that the radioactive effluent sampling and analysis requirements were satisfied and that discharges of radioactive materials were adequately quantified and evaluated.

The inspectors reviewed each of the radiological effluent controls program requirements to verify that the requirements were implemented as described in the licensee's RETS. For selected system modification since the last inspection, the inspectors reviewed changes to the liquid or gaseous radioactive waste system design, procedures, or operation, as described in the UFSAR and plant procedures.

The inspectors reviewed changes to the ODCM made by the licensee since the last inspection to ensure consistency was maintained with respect to guidance in NUREG-1301, 1302 and 0133 and Regulatory Guides 1.109, 1.21 and 4.1. If differences were identified, the inspectors reviewed the licensee's technical basis or evaluations to verify that the changes were technically justified and documented.

The inspectors reviewed the radiological effluent release report(s) for 2007 and 2008 in order to determine if anomalous or unexpected results were identified by the licensee, entered in the CAP, and adequately resolved.

The inspectors reviewed any significant changes in reported dose values from the previous radiological effluent release report, and the inspectors evaluated the factors which may have resulted in the change. If the change was not explained as being influenced by an operational issue (e.g., fuel integrity, extended outage, or major decontamination efforts), the inspectors independently assessed the licensee's offsite dose calculations to verify that the licensee's calculations were adequately performed and were consistent with regulatory requirements.

The inspectors reviewed the licensee's correlation between the effluent release reports and the environmental monitoring results, as provided in Section IV.B.2 of Appendix I to 10 CFR Part 50.

This inspection constitutes one sample as defined by Inspection Procedure 71122.01-5.

b. Findings

No findings of significance were identified.

.2 Onsite Inspection

a. Inspection Scope

The inspectors performed a walkdown of selected components of the gaseous and liquid discharge systems (e.g., gas compressors, demineralizers and filters (in use or in standby), tanks, and vessels) and reviewed current system configuration with respect to the description in the UFSAR. The inspectors evaluated temporary waste processing activities, system modifications, and the equipment material condition. For equipment or areas that were not readily accessible, the inspectors reviewed the licensee's material condition surveillance records, as applicable. The inspectors reviewed any changes that were made to the liquid or gaseous waste systems to verify that the licensee adequately evaluated the changes and maintained effluent releases as low as reasonably achievable.

During system walkdowns, the inspectors assessed the operability of selected point of discharge effluent radiation monitoring instruments and flow measurement devices. The effluent radiation monitor alarm set point values were reviewed to verify that the set points were consistent with RETS/ODCM requirements.

For effluent monitoring instrumentation, the inspectors reviewed documentation to verify the adequacy of methods and monitoring of effluents, including any changes to effluent radiation monitor set-points. The inspectors evaluated the calculation methodology and the basis for the changes to verify the adequacy of the licensee's justification.

The inspectors observed the licensee's sampling of liquid and gaseous radioactive waste (e.g., sampling of waste steams) and observed selected portions of the routine processing and discharge of radioactive effluents during the onsite inspection. Additionally, the inspectors reviewed several radioactive effluent discharge permits and assessed whether the appropriate treatment equipment was used and whether the radioactive effluent was processed and discharged in accordance with RETS/ODCM requirements, including the projected doses to members of the public.

The inspectors interviewed staff concerning effluent discharges made with inoperable (declared out-of-service) effluent radiation monitors to determine if appropriate compensatory sampling and radiological analyses were conducted at the frequency specified in the RETS/ODCM. For compensatory sampling methods, the inspectors reviewed the licensee's practices to determine if representative samples were obtained and if the licensee routinely relied on the use of compensatory sampling in lieu of adequate system maintenance or calibration of effluent monitors.

The inspectors reviewed surveillance test results for non-safety-related ventilation and gaseous discharge systems (high efficiency particulate air (HEPA) and charcoal filtration) to verify that the systems were operating within the specified acceptance criteria. In addition, the inspectors assessed the methodology the licensee used to determine the stack/vent flow rates to verify that the flow rates were consistent with the RETS/ODCM.

The inspectors reviewed the licensee's program for identifying any normally non-radioactive systems that may have become radioactively contaminated to determine if evaluations (e.g. 10 CFR 50.59 evaluations) were performed per IE Bulletin 80-10. The inspectors did not identify any unknown contaminated systems that may have been unmonitored discharge pathways to the environment.

The inspectors reviewed instrument maintenance and calibration records (i.e., both installed and counting room equipment) associated with effluent monitoring and reviewed quality control records for the radiation measurement instruments. The inspectors performed this review to identify any degraded equipment performance and to assess corrective actions, as applicable.

The inspectors reviewed the radionuclides that were included by the licensee in its effluent source term to determine if all applicable radionuclides were included (within detectability standards) in the licensee's evaluation of effluents. The inspectors reviewed waste stream analyses (10 CFR Part 61 analyses) to determine if hard-to-detect radionuclides were also included in the source term analysis.

The inspectors reviewed a selection of monthly, quarterly, and annual dose calculations to ensure that the licensee had properly demonstrated compliance with 10 CFR 50, Appendix I, and RETS dose criteria.

The inspectors reviewed licensee records to identify any abnormal gaseous or liquid tank discharges (e.g., discharges resulting from misaligned valves, valve leak-by, etc) to determine if the licensee had implemented the required actions. The inspectors determined if abnormal discharges were assessed and reported as part of the Annual Radioactive Effluent Release Report consistent with Regulatory Guide 1.21. There were no abnormal releases reported in the 2007 and 2008 annual effluent release reports.

The inspectors reviewed the licensee's effluent sampling records (sampling locations, sample analyses results, flow rates, and source term) for radioactive liquid and gaseous effluents to verify that the licensee's information satisfied the requirements of 10 CFR 20.1501.

This inspection constitutes one sample as defined by IP 71122.01-5.

b. Findings

No findings of significance were identified.

.3 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, Licensee Event Reports, and Special Reports related to the radioactive effluent treatment and monitoring program since the last inspection to determine if identified problems were entered into the CAP for resolution. The inspectors also assessed whether the licensee's self-assessment program was capable of identifying repetitive deficiencies or significant individual deficiencies in problem identification and resolution.

The inspectors reviewed corrective action reports from the radioactive effluent treatment and monitoring program since the previous inspection, interviewed staff, and reviewed documents to determine if the following activities were conducted in an effective and timely manner commensurate with their importance to safety and risk:

- initial problem identification, characterization, and tracking;
- disposition of operability/reportability issues;
- evaluation of safety significance/risk and priority for resolution;
- identification of repetitive problems;
- identification of contributing causes;
- identification and implementation of effective corrective actions;
- resolution of NCVs tracked in the corrective action system;
- implementation/consideration of risk significant operational experience feedback; and
- ensuring problems were identified, characterized, prioritized, entered into a corrective action, and resolved.

This inspection constitutes one sample as defined by IP 71122.01-5.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES**

4OA1 Performance Indicator Verification (71151)

.1 Unplanned Transients per 7000 Critical Hours

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Transients per 7000 Critical Hours Performance Indicator (PI) for Units 1 and 2 for the period beginning on the first quarter of 2008 through the end of the first quarter 2009. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, maintenance rule records, event reports and NRC Integrated Inspection Reports for the period of January 2008 through March 2009 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two unplanned transients per 7000 critical hours samples as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

## 4OA2 Identification and Resolution of Problems (71152)

### **Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Physical Protection**

#### .1 Routine Review of Resolution of Items Entered Into the Corrective Action Program

##### a. Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's CAP at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Attributes reviewed included: the complete and accurate identification of the problem; that timeliness was commensurate with the safety significance; that evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent of condition reviews, and previous occurrences reviews were proper and adequate; and that the classification, prioritization, focus, and timeliness of corrective actions were commensurate with safety and sufficient to prevent recurrence of the issue. Minor issues entered into the licensee's CAP as a result of the inspectors' observations are included in the attached List of Documents Reviewed.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure they were considered an integral part of the inspections performed during the quarter and documented in Section 1 of this report.

##### b. Findings

No findings of significance were identified.

#### .2 Daily Corrective Action Program Reviews

##### a. Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's CAP. This review was accomplished through inspection of the station's daily condition report packages.

These daily reviews were performed by procedure as part of the inspectors' daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

##### b. Findings

No findings of significance were identified.

.3 Semi-Annual Trend Review

a. Scope

The inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment issues, but also considered the results of daily inspector CAP item screening discussed in Section 4OA2.2 above, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the 6 month period of January 1 through June 30, 2009 although some examples expanded beyond those dates where the scope of the trend warranted.

The review also included issues documented outside the normal CAP in major equipment problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self assessment reports, and Maintenance Rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's CAP trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

The inspectors also specifically assessed the licensee's trend in human performance related to decision making as it was discussed in the Annual Assessment Letter to the licensee dated March 4, 2009.

This review constituted a single semi-annual trend inspection sample as defined in IP 71152-05.

b. Findings and Observations

Although some human performance issues continued in the area of decision making, the inspectors noted that the licensee had instituted substantial corrective actions and observed positive changes at the facility. Specifically, two NRC identified findings had been identified with cross-cutting aspects of decision making within the previous three quarters and a third item was identified in this inspection period. While actions to improve decision making were instituted across the facility, continued management oversight is warranted to sustain well-based decision making across the site. Findings

No findings of significance were identified.

.4 Selected Issue Follow-Up Inspection: Technical Support Center Chiller Issues

a. Scope

During a review of items entered in the licensee's CAP, the inspectors observed that the licensee was having numerous issues related to the Technical Support Center (TSC) chiller units. The inspectors selected this issue for a follow-up inspection of problem identification and resolution. Documents reviewed are listed in the Attachment to this report.

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

b. Findings and Observations

The TSC is one of the licensees' onsite emergency response facilities. It is designed to be habitable to the same degree as the control room for postulated accident conditions, except that the equipment is not Seismic Category I qualified, redundant or instrumented as in the control room. The TSC envelope also houses a computer room that contains the station's local area network (LAN) computers and gateway, the Emergency Response Data System (ERDS), the Illinois Emergency Management Agency's General Emergency Management System and other communication equipment. The TSC computer room has its own cooling system.

Using "TSC" as a keyword in a CAP search, the inspectors identified 24 IRs generated since June 2007, 15 of which were generated in 2008 and 7 of those were generated in 2009. All of the IRs were related to deficiencies in the TSC or TSC computer room cooling systems. The functions of these cooling systems are to provide an adequate environment for the responders during an event, and to protect the communication and emergency response-related equipment such as ERDS and the LAN that are housed in the TSC.

At the start of this inspection, the TSC cooling unit has a Freon leak and all three TSC computer room cooling units have various equipment issues and two of the three units were non-operational for the second half of 2008. When the third TSC room cooling unit failed in December 2008, a portable circulating fan had to be used with the computer room door propped open to keep the temperature down. The TSC temperature had occasionally gone up to 100°F because of the unavailability of the cooling unit. Although a TSC temperature of 100°F is not prohibited by the licensee's procedures, continued high temperatures in the TSC could reduce the life of the communication and emergency response-related equipment housed in the TSC.

The licensee has established a Chiller High Impact Team to address the number of issues on the TSC cooling systems. At the conclusion of this inspection period, the TSC chiller units were operational.

The elevated temperature in TSC only affected the comfort of the emergency responders and potentially the operating life of the communication equipment. Therefore, the licensee had met all the requirements for radiological protection for the TSC with the High Efficiency Particulate HEPA and charcoal filtration being operable, and no issues of significance were identified.

Although several deficiencies were associated with the TSC cooling systems noted over the last 3 years, the timeliness of the licensee corrective actions were commensurate with the safe function of the equipment.

#### 4OA5 Other Activities

##### .1 (Open) URI (05000454/2009003-02; 05000455/2009003-02): Diesel Oil Storage Tank Vent Lines Regulatory Compliance

The inspectors noted that the diesel oil storage tank (DOST) vent piping was non-safety related and was located in a non-safety related structure. Subsequent inspector questions focused on the DOST's ability to vent if the vent lines were crimped during a seismic or tornado generated missile event.

During the course of the inspection, the inspectors ascertained that in the associated amendments and Supplemental Safety Evaluation Reports of the early 1980's, the NRC reviewer's position was that the vents needed to be seismic and missile protected. Subsequent to that time, communications between the licensee and the NRC resulted in the NRC reviewers' accepting the licensee's design where the vent lines were routed through the Category II turbine building. However, the reviewers' basis was that the licensee had committed to make the vent lines seismically supported, that the licensee had stated that the vent lines would break before crimping, that there were alternate vent paths and that the lines were designed in accordance with ANSI B31.1 piping standards.

The NRC inspectors determined that the lines were not modified to be seismically supported and that there were no calculations supporting the break before crimp position. Piping experts consulted by the licensee also indicated that the lines would crimp before breaking. Although alternate vent paths do exist, there was no instrumentation that would alert the plant operators to a need for the alternate vent paths prior to diesel generator operability impact. There were also no procedures, training, or tools needed by the operators to establish the alternate vent paths. A more detailed review of the docket by the inspectors and the licensee determined that there was no actual submittal by the licensee stating they would upgrade the vent paths to seismic grade and the source of the NRC reviewer's comment could not be located.

The licensee initiated IR 877430 and performed a prompt operability determination. The licensee concluded that the diesel oil storage tanks and the diesel generators remained operable, but degraded in the installed configuration specifically that the NRC reviewer's basis for accepting this changes from the design requirements was not valid.

The inspectors reviewed the operability determination with no issues identified regarding operability. However, this issue will remain unresolved pending further review of the installed configuration and assessment of 10 CFR 50.109(a)(4) to determine if a modification is necessary to bring the facility into compliance with the rules or orders of the Commission (**URI 05000454/2009003-02; 05000455/2009003-02**).

##### .2 (Closed) NRC Temporary Instruction 2515/173 Review of the Industry Ground Water Protection Voluntary Initiative

###### a. Inspection Scope

An NRC assessment was performed of the licensee's implementation at Byron Station of the Nuclear Energy Institute – Ground Water Protection Initiative (NEI-GPI) (dated August 2007 (ML072610036)). The inspectors assessed whether the licensee evaluated

work practices that could lead to leaks or spills and performed an evaluation of systems, structures, and components that contain licensed radioactive material to determine potential leak or spill mechanisms.

The inspectors verified that the licensee completed a site characterization of geology and hydrology to determine the predominant ground water gradients and potential pathways for ground water migration from onsite locations to off-site locations. The inspectors also verified that an onsite ground water monitoring program had been implemented to monitor for potential licensed radioactive leakage into groundwater and that the licensee had provisions for the reporting of its ground water monitoring results. (See <http://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-info.html>)

The inspectors reviewed the licensee's procedures for the decision making process for potential remediation of leaks and spills, including consideration of the long term decommissioning impacts. The inspectors also verified that records of leaks and spills were being recorded in the licensee's decommissioning files in accordance with 10 CFR 50.75(g).

The inspectors reviewed the licensee's notification protocols to determine whether they were consistent with the Groundwater Protection Initiative. The inspectors assessed whether the licensee identified the appropriate local and state officials and conducted briefings on the licensee's ground water protection initiative. The inspectors also verified that protocols were established for notification of the applicable local and state officials regarding detection of leaks and spills.

b. Findings

No findings of significance were identified; however, as specified in 2515/173-05, the inspectors identified the following deviations from Nuclear Energy Institute – Ground Water Protection Initiative (NEI-GPI) protocols or areas within the NEI-GPI that were not fully addressed within the licensee's program.

(1) GPI Objective 1.4 - Remediation Process.

- a. *Establish written procedures outlining the decision making process for remediation of leaks and spills or other instances of inadvertent releases. This process is site specific and shall consider migration pathways.*

The licensee had not established written procedure(s) outlining the decision making process for remediation of leaks and spills or other instances of inadvertent releases that are site specific and consider migration pathways.

- b. *Evaluate the potential for detectible levels of licensed material resulting from planned releases of liquids and/or airborne materials.*

The licensee had not performed/completed an evaluation of the potential for detectible levels of licensed material from planned releases of liquids and/or airborne materials (e.g., rain-out and condensation). The licensee determined that an additional evaluation was not required because the licensee had analyzed the Construction Run-Off Pond for licensed material. However, the inspectors questioned whether some uncertainties in the sample location (i.e., the potential for significant dilution) and the annual frequency

ensured the samples collected were representative of material from planned releases of liquids and/or airborne materials (e.g., rain-out and condensation).

(2) GPI Objective 2.1 - Stakeholder Briefing.

- b. Licensees should consider including additional information or updates on ground water protection in periodic discussions with State/Local officials.*

The licensee had not included additional information or updates on ground water protection in periodic discussions with State/Local officials.

4OA6 Management Meetings

.1 Exit Meeting Summary

On July 8, 2009, the inspectors presented the inspection results to D. Enright, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

.2 Interim Exit Meetings

Interim exits were conducted for:

- Occupational radiation safety program for Instrumentation and Public Radiation Safety cornerstone programs for Effluent and Groundwater Protective Initiative with Mr. D. Enright and other members of the licensee's staff on May 15, 2009.

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

4OA7 Licensee-Identified Violations

The following violations of very low significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as an NCV.

- 10 CFR 50, Appendix B, Criterion III, "Design Control," states, in part, that measures shall be established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems and components. Contrary to this, in March 2008 for Unit 1, and March 2007 for Unit 2, the licensee implemented a modification to the Emergency Core Cooling System throttle valve design using a material (gas nitrided stainless steel) that was prohibited by design specifications and contributed to flow rates in the pump runout region of the high head and intermediate head safety injection pumps. This violation was of very low safety significance because the design deficiency did not result in a loss of operability or functionality of the emergency core cooling systems. The licensee entered into the CAP as IR 908529.

- 10 CFR 70.51(b)(1), as issued on January 1, 1986, requires each licensee to “keep records showing receipt, inventory (including location), disposal, acquisition, and transfer of all special nuclear material in his possession regardless of its origin or method of acquisition.” Contrary to this requirement, in 1986, a source containing 1 micro-curie of special nuclear material was ordered, received, used, and disposed as part of a project performed by a member of the licensee’s health physics staff. However, the special nuclear material coordinator was not aware of the purchase, and therefore, the source was not entered in to the appropriate tracking logs. The licensee disposed of the empty vial that was used to deliver the special nuclear material in 1990. This incident was identified in the licensee’s corrective action program as IR 864861 and IR 886232. This was determined to be a Severity IV violation because it involved an isolated failure to secure, or maintain surveillance over licensed material in a quantity greater than 10 times but not greater than 1000 times the quantity specified in Appendix C to Part 20. Additionally, the material was labeled as radioactive, located in an area posted as containing radioactive materials; and the failure occurred despite a functional program to detect and deter security violations that included training, staff awareness, detection, and corrective action.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

D. Enright, Site Vice President  
B. Adams, Plant Manager  
B. Askren, Security Director  
C. Gayheart, Operations Director  
D. Gudger, Regulatory Assurance Manager  
L. Bogue, Training Manager  
M. Dahms, Maintenance Support Manager  
B. Jacobs, Sr. Design Engineering Manager  
P. Johnson, NOS Manager  
S. Kerr, Chemistry Manager  
V. Naschansky, Electrical Design Manager  
B. Riedl, Acting Project Management Manager  
D. Thompson, Radiation Protection Manager

#### Nuclear Regulatory Commission

R. Skolowski, Branch Chief  
B. Bartlett, Senior Resident Inspector  
J. Robbins, Resident Inspector

**LIST OF ITEMS OPENED, CLOSED AND DISCUSSED**

Opened

05000455/2009003-01	NCV	Failure to Comply with TS 3.4.13.B Reactor Coolant Pressure Boundary Leakage
05000454/2009003-02 05000455/2009003-02	URI	Diesel Oil Storage Tank Vent Regulatory Compliance Backfit May be Required

Closed

05000455/2009003-01	NCV	Failure to Comply with TS 3.4.13.B Reactor Coolant Pressure Boundary Leakage
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## **LIST OF DOCUMENTS REVIEWED**

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

### **Section 1R01: Adverse Weather Protection**

OP-AA-108-107-1001; Station Response to Grid Capacity Conditions, Revision 2  
OP-AA-108-107-1002; Interface Agreement Between Exelon Energy Delivery and Exelon Generation for Switchyard Operations, Revision 4  
OP-AA-108-107; Switchyard Control, Revision 2  
WC-AA-8000; Interface Procedure Between Exelon Energy Delivery (Comed/Peco) and Exelon Generation (Nuclear/Power) for Construction and Maintenance Activities, Revision 2  
WC-AA-8003; Interface Procedure Between Exelon Generation (Nuclear/Power) for Design Engineering and Transmission Planning Activities, Revision 1  
IR 932840; One Broken Strand of Fence Wire South End of Switchyard, June 18, 2009  
IR 932857; Gravel Starting to Wash Out Along Bottom of Switchyard Fence, June 18, 2009  
IR 929613; 1WS143 Failed Open, June 10, 2009  
Diagram of Non-Essential Service Water System M-43 Sheet 2A, Rev AF

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

IR 927025; Piping Downstream of 0VQ003 Corroded, June 02, 2009  
IR 927294; NRC Outside Site Walkdown, June 02, 2009

### **Section 1R04: Equipment Alignment (Quarterly)**

BOP DG-M1B; Train B Diesel Generator System Valve Lineup, Revision 11  
BOP DG-M1; Diesel Generator System Valve Lineup, Revision 18  
BOP DG-E1B; Unit 1 Train B Diesel Generator Electrical Lineup, Revision 2  
BOP DG-E1; Unit 1 Diesel Generator Electrical Lineup, Revision 6  
Drawings; M-50, Diagram of Diesel Fuel Oil; Sheet 1A - Revision AR, Sheet 1B - Revision AN, Sheet 1C - Revision AN, Sheet 1D - Revision AN, Sheet 5 - Revision H

### **Section 1R05: Fire Protection (Quarterly)**

Byron Station Pre-Fire Plans, Zone 5.6-1; Division 11 Miscellaneous Electrical Equipment and Battery Room, Revision 5  
Byron Station Pre-Fire Plans, Zone 11.5A-1, Unit 1 Electrical Penetration Area, Revision 5  
Byron Station Pre-Fire Plans, Zone 11.5A-2; Unit 2 Electrical Penetration Area, Revision 5  
Byron Station Pre-Fire Plans, Zone 10.1-1; 1B Diesel Fuel Oil Storage Tank Room, Revision 6  
Byron Station Pre-Fire Plans, Zone 9.1-1; 1B Diesel Generator and Day Tank Room, Revision 5

## **Section 1R06: Flood Protection Measures**

Unit 2 SX Pump Room

0BMSR DD-1; Water-Tight Barrier Inspection (CM-6.1.1.), Revision 5

Drawing 1SD1; Watertight Bulkhead Doors # SD1, SD2, SD3, and SD4 General Arrangement

## **Section 1R11: Licensed Operator Regualification Program**

Cycle 09-3, Out of the Box Evaluation Scenario, Revision 1

## **Section 1R12: Maintenance Effectiveness**

IR 752949; Need Work Order to Reconcile Boric Acid Pump Issues, March 21, 2008

IR 785140; Failed Post Maintenance Test – 2B SAC “Change Inlet Filter” Alarm Still Lit, June 10, 2008

IR 785280; Work Request Needed to Troubleshoot Frequency Cycling of the 2SA390B, June 11, 2008

IR 785780; 1 Year PM for the SAC Require Changes, June 12, 2008

IR 788763; Disk Out Indication, May 30, 2008

IR 789245; 2W MPT Breakers 8-4 and 8-9 Tripped, June 23, 2008

IR 792959; 2B SAC Package Discharge Temperature HI, July 02, 2008

IR 792964; 2B SAC Inlet Vacuum Low, July 02, 2008

IR 804572; Received Unexpected Generator Volt Reg Trouble Alarm, August 06, 2008

IR 805773; Abnormal Water Flow from SA Receiver Blowdown, August 11, 2008

IR 806949; Unit 1 Generator has Low Insulation Reading, August 14, 2008

IR 812790; 2B SAC Trip Causes Reduction in SA/IA Header Pressure, August 31, 2008

IR 815475; Loss of 1A & 2B SAC, September 09, 2008

IR 815792; 2SA10CB; Perform Troubleshooting, September 09, 2008

IR 821914; DC BUS 211 Ground, September 24, 2008

IR 829302; Deficiencies Found During Main Generator Crawl Through, October 09, 2008

IR 829391; Deficiencies Found During Phase and Neutral Bushing Box Inspection, October 10, 2008

IR 833862; Crackling Noise Coming from Cooling Group No.2 Transformer, October 21, 2008

IR 858464; Group 1 Bank 4 Breaker Tripped Open, December 19, 2008

IR 860396; Unexpected alarm 125VDC BUS 211 Ground, December 27, 2008

IR 860783; DC BUS 211 Ground Annunciator Comes In, December 29, 2008

IR 861426; 2E MPT Cooling Bank 4 Water in Electrical Connector for Fans, December 30, 2008

IR 866827; Byron Not in Compliance with Power Transformer PCM Template, January 14, 2009

IR 890145; DC BUS 211 Has +95VDC Ground, March 09, 2009

IR 897167; Level II Ground on BUS 211, March 25, 2009

IR 897637; DC BUS 211 Ground Troubleshooting, March 25, 2009

IR 899326; Unexpected Annunciator, March 29, 2009

IR 904254; NERC Compliance FASA Identified Unit 1 Exciter/PSS Modeling, April 07, 2009

IR 907806; Unit 1 Boric Acid Storage Tank Liner Degraded, April 15, 2009

IR 909320; 211 DC High Grounds, April 20, 2009

IR 913515; 2AB03P Pump Bearing Housing Temps High, April 29, 2009

IR 918383; Low Resistance Reading on Turbine Generator, May 11, 2009

IR 920486; DC Bus 211 Ground, April 26, 2009

IR 919481; 2B SAC Package Discharge Temperature High, May 3, 2009

IR 920878; 2SA10CB Work Window Issues, May 18, 2009

IR 922994; Lessons Learned from 2B SAC Cooler Cleaning (FNM WR 304289), May 22, 2009

IR 923206; 1B/2B SAC's Cycling Different than Setpoints, May 22, 2009  
IR 923864; Main Power Transformer Single Point Vulnerability Review RES, May 26, 2009  
IR 927061; Summer Readiness of 1E MPT Degraded, June 02, 2009  
BOP SA-12; Operations of Sierra Station Air Compressor, Revision 25  
MA-AA-716-004; Troubleshooting Plan, April 20, 2009, Revision 7  
Drawing 6E-2-3374; Byron Unit 2 Electrical Installation Auxiliary Building Partial Plan  
Elevation 463'-0", Revision BN  
Drawing 6E-0-3502; Electrical Installation Essential Service Cooling Tower 0A Plan –  
Switchgear Room Elevation 874'-0", Revision AX  
Drawing 6E-0-3680; Duct Run Routing Outdoor – West of Station, Revision AF

### **Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

Unit 1 Risk Configurations; Week of 05/25/09, Revision 1  
Unit 2 Risk Configurations; Week of 05/25/09, Revision 1  
Protected Equipment Log for Unit 2 Auxiliary Feedwater Flow Calibration; dated 05/27/09  
Protected Equipment Log for 0SX147 & 1SX010 Unavailable; dated 05/28/09  
Protected Equipment Log for 2SX034 Unable to Open & Unable to Close; dated 05/28/09  
Protected Equipment Log for Unit 1 Train B Diesel Generator Vent Fan; dated 05/29/09  
IR 932515; Check Valve 0SX28A Leaking By, June 18, 2009

### **Section 1R15: Operability Evaluations**

EC 375875; Initial Leak Seal Clamp on 1CW20AB-6" Pipe to Stop/Contain Through Wall Leak  
and Evaluate for Wall Thinning  
Cases of ASME Boiler and Pressure Vessel Code N-523-2, October 02, 2000  
Cases of ASME Boiler and Pressure Vessel Code N-597-2, November 18, 2003  
Issue 932448; Unit 2 Pressurizer PORV Accumulator 2A Low Pressure Alarm, June 17, 2009  
EC 375875 Rev. 0; Install Leak Seal Clamp on 1CW20AB-6" Pipe to Stop/Contain Through Wall  
Leak and Evaluate for Wall Thinning  
EC 375987 00; Operations Evaluation 09-003, OA SX Makeup Pump Discharge Check Valve  
Leaking By, June 23, 2009  
IR 940534; Probable Dispute of Potential NRC Violation, June 24, 2009

### **Section 1R18: Plant Modifications**

EC 375313; Plugging of Gland Steam Leak at Unit 2 HP Turbine, May 05, 2009  
EC 374690; Add Temporary Weight on 1B AF Pump Gearbox to Improve Vibrations,  
March 19, 2009

### **Section 1R19: Surveillance Testing**

WO 1018533 01; Replacement of the Fuel Shutoff Solenoid, August 24, 2007  
WO 1060464 02; Replace OLS-SX096 Level Probe and Switch Assembly, May 22, 2009  
WO 1062976 12; 1SX019A Leaks By, June 23, 2009  
WO 1083921-01; Perform Thermal Overload Testing (1SX010), dated 05/29/09  
WO 1083921-02; OPS PMT – 1SX010 Stroke  
WO 1199056-01; Hi DP Alarm Came In Early  
WO 1199056-02; OPS PMT Task Hi DP Alarm Came In Early  
WO 1215696 01; 2BOSR 3.1.5-2, Train B SSPS Bi-Monthly Surveillance, June 30, 2009

WO 1223817 01; 1CS01PA Comprehensive IST Requirements for Containment Spray Pump, June 23, 2009  
WO 1236031 01; 0A SX Makeup Pump Operability Surveillance, June 16, 2009  
Clearance Order 73701; 1PDS-VD071 – Replace Transmitter  
IR 919415; MMD Loosened Wrong Bolts on 1DG01KA Turning Gear, May 13, 2009  
Issue 920190; All Issues on Turning Gear Wrong Bolts Loosened Not Addressed, May 13, 2009  
BMP 3108-9; Engaging and Disengaging of Diesel Generator Turning Gear, Revision 7  
BMP 3208-1; Emergency Stand-By DG Engine 6-Year/20-Year Surveillance, Revision 20  
BOP AF-7; Diesel Drive Auxiliary Feedwater Pump B Startup on Recirc, Revision 34

### **Section 1R22: Surveillance Testing**

BIP 2500-161; Calibration of RCP Seal Water Injection Flow Loop, Revision 2  
IR 781472; Repeated SD Leak Issues, May 31, 2008  
IR 805496; 2C SG Lower SD Flow Isolation Valve, August 08, 2008  
IR 806396; Both Units SD Systems Degraded for >5 years, August 12, 2008  
IR 818280; 2SD02PA Failed PMT, September 16, 2008  
IR 822784; 2SD005C Air Regulator Requires EQ Requirement, September 26, 2008  
IR 860294; 2SD005C Stroke Time Near Admin Limit, December 26, 2008  
IR 875858; Flow Indicator Shows Flow When Isolated, February 03, 2009  
IR 933440; 2SD007 Tripped Shut for No Apparent Reason, June 20, 2009  
WO 1182264 01; 1B Diesel Generator Operability Semi-Annual Surveillance, April 24, 2009  
WO 1207861 01; STT for 1AF013E-H, May 01, 2009  
WO 1226372 01; 1B AF Pump Surveillance, May 01, 2009  
WO 1222389 01; STT for 2SD002A-H and 2SD005A-D (week B), June 22, 2009

### **Section 1EP6: Drill Evaluation**

EP Pre-Exercise Drill Scenario – June 12, 2009

### **Section 2OS3: Radiation Monitoring Instrumentation and Protective Equipment**

BRP-5800-1; Use of Air Ionization Chambers and Geiger-Mueller Instruments for Measuring Personnel Exposures; Revision 14  
BRP-5800-3; Area Radiation Monitoring System Alert/High Alarm Setpoints; Revision 25  
BRP-5800-9; 1(2)RE-AR011(12) Fuel Handling Incident Monitor Setpoint Change; Revision 09  
BRP-5820-14; Process Radiation Monitoring System Alert/High Alarm Setpoints; Revision 37  
BRP-5821-4; Operation of the Eberline AMS-3 Beta Air Monitor; Revision 07  
BRP 5822-10; Calibration, Source Check, and Maintenance of the Eberline PM-7 Portal Monitors; Revision 21  
BRP 5822-11; Calibration of Nuclear Enterprises Small Articles Monitor (SAM); Revision 14  
BRP-5823-26; Calibration and Operation of the Eberline Model RO-7; Revision 11  
BRP-5823-38; Operation and Calibration of the Ram Gam 1; Revision 07  
BRP-5823-40; Operation of the Merlin-Gerin Telepole; Revision 07  
BRP-5825-3; Operation and Use of the J.L. Shepherd Model 89 Gamma Calibration; Revision 11  
BRP-5825-7; J.L. Shepherd Model 89 Gamma Calibration Unit Certification to Establish NIST Traceability; Revision 08  
RP-BY-700; Controls for Radiation Protection Instrumentation; Revision 02  
RP-BY-700-1001; Instrument Calibration and Source Check Settings; Revision 24

RP-BY-825-1000; Maintenance Care and Inspection of the Viking Self-Contained Breathing Apparatus; Revision 11  
Calibration Records of the High Range Containment Radiation Monitors (1/2AR-020 and 1/2AR-021); 2007 and 2008  
Calibration Records of Electronic Dosimeter from Zion Station; March 2007 and March 2008  
Calibration Records of the IPM-8M; various 2008  
Calibration Records of the PM-7 Portal Monitor; May 2009  
Condition Reports associated with PowerLab portable radiation survey and monitoring instruments, station radiation survey and monitoring instruments, and containment high range radiation monitors; various dates 2007 and 2008  
Exelon PowerLabs Audit – 2008-10; Exelon PowerLabs Coatsville, Pa; September 2008  
Formal Benchmark Report (AR No. 670099); PowerLabs Coatsville, PA; Undated  
Position Papers Assessing Isotopic Mix and Percent Abundance Data (Part 61) on Radiation Survey and Monitoring Equipment Performance; various dates 2007 and 2008  
Quality Assurance Program Implementation, Internal Audit Report; May 2008  
Respiratory Protection Lesson Plan; 06GRS2; Revision 00  
Respirator Qualification, Maintenance and Training Records; various dates 2008  
Self-Assessment – 699118; Radiation Protection Instrumentation and Protective Equipment; June 2008  
Self-Assessment – 842820; Radiation Protection Instrument Check-in; February 2009  
SCBA Bottle Hydro Tests and Maintenance Records; various dates 2008

### **Section 2PS1: Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems**

Annual Radioactive Effluent Release Report; 2007  
Annual Radioactive Effluent Release Report; 2008  
Functional Area Self Assessment (FASA) 831375; Radioactive Gaseous and Liquid Effluents; March 31, 2009  
CY-AA-110-200; Sampling; Revision 8  
CY-AA-130-200; Quality Control; Revision 7  
CY-BY-110-600; Chemistry Sample Points; Revision 27  
Technical Requirements Manual (TRM); Section 3.11; Radiological Effluents; December 2008  
CY-BY-170-301; Offsite Dose Calculation Manual; Revision 6  
CY-AA-170-210; Potentially Contaminated System Controls; Program; Revision 0  
CY-AA-170-215; Release of Bulk Fluids From Potentially Contaminated Plant Systems; Revision 0  
CY-AA-170-2150; PCSC Program Implementation Guidelines; Revision 0  
IR 00783135; Removal of ODCM Special Reporting Requirements; June 5, 2008  
IR 00909590; Communication Failures for 1PR02J LCO Entry; April 20, 2009  
IR 00904109; Actual Vent Stack Flow Rates vs. UFSAR; April 7, 2009  
IR 00877744; Spike on 2PR01J Results in Containment Release Termination; February 7, 2009  
IR 00805788; 1PR028J Tritium Sample; August 11, 2008  
WO 00902761; Perform Calibration of 01PR01J; August 17, 2007  
WO 00934411; Calibration of Rad Monitor 2PR28J; August 24, 2007  
WO 00935870; Calibration of Rad Monitor 1PR28J; October 08, 2007  
WO 00979053; Calibration of 0PR05J; March 06, 2008

### **Section 4OA1: Performance Indicator Verification**

Power History Curves for Unit 1 and Unit 2 from May 2008 – April 2009

## **Section 40A2: Identification and Resolution of Problems**

Drawing M-94, Diagram of Technical Support Center Ventilation System, Sheet 2, Revision P  
Drawing M-94, Diagram of Technical Support Center Ventilation System, Sheet 3, Revision H  
WO 1038609; TSC Ventilation HEPA Filter Performance Test, December 8, 2008  
WO 1038610; TSC Ventilation System Charcoal Absorber Bank Operability,  
December 10, 2008  
TSC Ventilation Work Order Backlog, dated 05/26/09  
IR 929246; Visiting NRC Inspector Access Hindered at PAF, June 08, 2009

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

IR 907593; Discrepancy in Operations Log Entry, April 14, 2009  
IR 908794; Walkdown Results, April 16, 2009  
IR 909409; Pre-Fire Plan Discrepancy, April 20, 2009  
IR 909634; Missing Screws in Electrical Cabinet Doors, April 20, 2009  
IR 909808; Missing Screws in Electrical Cabinet Doors, April 20, 2009  
IR 909817; Bowed-Out Door on Electrical Cabinet, April 20, 2009  
IR 910064; NRC Comments on Fire Protection Issues, April 21, 2009  
IR 909222; Metal Strip That Holds the Weather Stripping on is Broken, April 19, 2009  
IR 909229; Weather Stripping is Ragged, April 19, 2009  
IR 909251; Box with Switchplate Hanging Down By MCC 133X4 D1, April 19, 2009  
IR 909216; Fire Protection Valve Packing Leak, Previous IR Closed Packing Still Leaking,  
December 31, 1960  
IR 909119; Nitrogen Test Isolation Valve 1NT041D Has a Bent Operator, April 16, 2009  
IR 937811; NRC Walkdown at CW Pump House, June 29, 2009

## **Section 40A5: Other Activities**

Functional Area Self Assessment (FASA); AR 838638-02; Radioactive Groundwater Protection  
Program (RGPP) Assessment as required per NEI 0707; December 16, 2008  
CY-AA-170-400; Radiological Groundwater Protection Program; Revision 4  
CY-AA-170-4000; Radiological Groundwater Protection Program Implementation; Revision 4  
LS-AA-1120; Reportable Event RAD 1.1 Reportability Manual; Revision 10  
EN-AA-407; Response to Unplanned Discharges of Licensed Radionuclides to Groundwater,  
Surface Water, or Soil; Revision 1  
CY-BY-170-4160; Radioactive Groundwater Protection Program Scheduling and Notification;  
Revision 4  
Hydrogeologic Investigation Work Plan; Fleetwide Tritium Assessment; Byron Generating  
Station; May 2006

## LIST OF ACRONYMS USED

AC	Alternating Current
ADAMS	Agencywide Document Access Management System
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CEDE	Committed Effective Dose Equivalent
CFR	Code of Federal Regulations
DOST	Diesel Oil Storage Tank
ECCS	Emergency Core Cooling System
ERDS	Emergency Response Data System
HEPA	High Efficiency Particulate
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Inspection Report
IR	Issue Report
IST	Inservice Testing
LAN	Local Area Network
NCV	Non-Cited Violation
NEI-GPI	Nuclear Energy Institute – Groundwater Protection Initiatives
NRC	U.S. Nuclear Regulatory Commission
ODCM	Occupational Dose Calculation Manual
PARS	Publicly Available Records
PI	Performance Indicator
RCPB	Reactor Coolant Pressure Boundary
RCA	Radiological Control Area
RCS	Reactor Coolant System
RETS	Radiological Effluent Technical Specifications
RP	Radiation Protection
SCBA	Self-Contained Breathing Apparatus
SDP	Significance Determination Process
SSC	Structures, Systems, and Components
SX	Essential Service Water System
TS	Technical Specification
TSC	Technical Support Center
TSO	Transmission System Operator
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item