



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
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November 2, 2017

Mr. Bryan C. Hanson  
Senior VP, Exelon Generation Company, LLC  
President and CNO, Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

SUBJECT: BYRON STATION, UNITS 1 AND 2 – NRC INTEGRATED INSPECTION REPORT  
05000454/2017003 AND 05000455/2017003

Dear Mr. Hanson:

On September 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Byron Station, Units 1 and 2. On October 11, 2017, the NRC inspectors discussed the results of this inspection with Mr. T. Chalmers and other members of your staff. The results of this inspection are documented in the enclosed report.

The NRC did not identify any findings of significance during this inspection period.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

*/RA/*

Eric R. Duncan, Chief  
Branch 3  
Division of Reactor Projects

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

Enclosure:  
IR 05000454/2017003; 05000455/2017003

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Letter to Bryan C. Hanson from Eric Duncan dated November 2, 2017

SUBJECT: BYRON STATION, UNITS 1 AND 2 – NRC INTEGRATED INSPECTION REPORT  
05000454/2017003 AND 05000455/2017003

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 05000454; 05000455  
License Nos: NPF-37; NPF-66

Report No: 05000454/2017003, 05000455/2017003

Licensee: Exelon Generation Company, LLC

Facility: Byron Station, Units 1 and 2

Location: Byron, IL

Dates: July 1 through September 30, 2017

Inspectors: J. McGhee, Senior Resident Inspector  
C. Hunt, Resident Inspector  
J. Cassidy, Senior Health Physicist  
T. Go, Health Physicist  
C. Thompson, Resident Inspector,  
Illinois Emergency Management Agency

Approved by: E. Duncan, Chief  
Branch 3  
Division of Reactor Projects

Enclosure

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## **SUMMARY**

Inspection Report 05000454/2017003, 05000455/2017003; 07/01/2017 – 09/30/2017; Byron Station, Units 1 and 2; Routine Integrated Inspection Report

This report covers a three month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. No findings were identified by the inspectors. The significance of inspection findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within the Cross-Cutting Areas," dated December 4, 2014. All violations of the U.S. Nuclear Regulatory Commission (NRC) requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

### **NRC-Identified and Self-Revealed Findings**

None identified.

### **Licensee-Identified Findings**

None identified.

## REPORT DETAILS

### Summary of Plant Status

#### **Unit 1**

Byron Unit 1 operated at scheduled power levels for the entire inspection period.

#### **Unit 2**

Byron Unit 2 operated at scheduled power levels for the entire inspection period. The unit began coasting down on September 22, 2017, to begin a scheduled refueling outage.

### **1. REACTOR SAFETY**

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

#### 1R04 Equipment Alignment (71111.04)

##### .1 Quarterly Partial System Walkdowns

##### a. Inspection Scope

The inspectors performed partial system walkdowns of the following risk-significant systems:

- Units 1 and 2 component cooling water pumps and heat exchangers after pump swaps and valve maintenance;
- 1A diesel generator (DG) electrical, air, lubricating oil and fuel oil system lineups following surveillance testing;
- Unit 2 essential service water (SX) following monthly lineup verification; and
- Train "A" of the control room ventilation (VC) system with Train "B" out-of-service for maintenance.

The inspectors selected these systems based on their 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, the Updated Final Safety Analysis Report (UFSAR), Technical Specifications (TS) requirements, outstanding work orders (WOs), issue reports (IRs), 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 corrective action program (CAP) with the appropriate significance characterization.

These activities constituted four partial system walkdown samples as defined in IP 71111.04–05.

b. Findings

No findings 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 the availability, accessibility, and condition of firefighting equipment in the following risk-significant plant areas:

- Unit 0 auxiliary building 383'-0" elevation – auxiliary building remote shutdown and radwaste;
- Unit 2 auxiliary building 364'-0" elevation – containment pipe penetration area;
- Unit 1 miscellaneous area 377' 0" elevation – main steam and auxiliary feedwater pipe tunnel;
- Unit 1 auxiliary building 451' 0" elevation – division 11 miscellaneous electrical equipment room (MEER);
- Unit 1 auxiliary building 451' 0" elevation – division 12 MEER;
- Unit 1 auxiliary building 426'-0" elevation – division 12 electrical penetration area; and
- Unit 2 auxiliary building 426'-0" elevation – division 22 electrical penetration area.

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 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. 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 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.

These activities constituted seven quarterly fire protection inspection samples as defined in IP 71111.05–05.

b. Findings

No findings were identified.

.2 Annual Fire Protection Drill Observation (71111.05A)

a. Inspection Scope

On August 5, 2017, the inspectors observed a fire brigade activation for a simulated fire in the Unit 1 west main power transformer. Based on this observation, the inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that the licensee staff identified deficiencies, openly discussed them in a self-critical manner at the drill debrief, and took appropriate corrective actions. Specific attributes evaluated were:

- proper wearing of turnout gear and self-contained breathing apparatus;
- proper use and layout of fire hoses;
- employment of appropriate firefighting techniques;
- sufficient firefighting equipment brought to the scene;
- effectiveness of fire brigade leader communications, command, and control;
- search for victims and propagation of the fire into other plant areas;
- smoke removal operations;
- utilization of pre-planned strategies;
- adherence to the pre-planned drill scenario; and
- drill objectives.

These activities constituted one annual fire protection inspection sample as defined in IP 71111.05–05.

b. Findings

No findings were identified.

1R07 Annual Heat Sink Performance (71111.07)

.1 Heat Sink Performance

a. Inspection Scope

The inspectors reviewed the licensee’s testing of the 1B containment spray (CS) cubicle cooler heat exchangers to verify that potential deficiencies did not mask the licensee’s ability to detect degraded performance, to identify any common cause issues that had the potential to increase risk, and to ensure that the licensee was adequately addressing problems that could result in initiating events that would cause an increase in risk. The inspectors reviewed the licensee’s observations as compared with acceptance criteria, the correlation of scheduled inspections, and the impact of instrument inaccuracies on test results.

This annual heat sink performance inspection constituted one sample as defined in IP 71111.07–05.

b. Findings

No findings were identified.



1R11 Licensed Operator Requalification Program (71111.11)

.1 Resident Inspector Quarterly Review of Licensed Operator Requalification (71111.11Q)

a. Inspection Scope

On September 12, 2017, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator requalification training. The inspectors verified that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and that 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.

This inspection constituted one quarterly licensed operator requalification program simulator sample as defined in IP 71111.11-05.

b. Findings

No findings were identified.

.2 Resident Inspector Quarterly Observation During Periods of Heightened Activity or Risk (71111.11Q)

a. Inspection Scope

On September 27, 2017, the inspectors observed the Unit 2 control room operating crew during performance of main steam safety valve testing and concurrent 2B diesel generator surveillance testing. This was an activity that required heightened awareness or was related to increased risk as operators were required to perform reactivity manipulations during periods of high activity in the main control room. 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 (if applicable);
- correct use and implementation of procedures;
- coordination with maintenance and contract personnel performing manipulations in the field;

- control board manipulations;
- oversight and direction from supervisors; and
- ability to identify and implement appropriate TS requirements.

The performance in these areas was compared to pre-established operator action expectations, procedural compliance and task completion requirements.

This inspection constituted one quarterly licensed operator heightened activity/risk sample as defined in IP 71111.11–05.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations

a. Inspection Scope

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

- Process radiation monitoring system; and
- Service air system.

The inspectors reviewed past events including those in which 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 Title 10 of the *Code of Federal Regulations* (CFR) Part 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.

This inspection constituted two quarterly maintenance effectiveness samples as defined in IP 71111.12–05.

b. Findings

No findings 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 shutdown risk evaluation and risk management plan for the Unit 2 refueling outage scheduled to begin on October 2, 2017. The licensee captured the planned risk management actions and mitigating contingency plans affecting risk-significant and safety-related systems in the B2R20 safe shutdown management plan.

The shutdown risk evaluation and risk management plan was selected for review based on the overall potential risk significance relative to the Reactor Safety Cornerstones. The inspectors reviewed the scope of maintenance work included in the outage schedule, discussed the results of the assessment with the licensee's probabilistic risk analyst, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed TS requirements and attended the licensee's management oversight meeting that approved the plan.

This maintenance risk assessments constituted one sample as defined in IP 71111.13-05.

b. Findings

No findings were identified.

1R15 Operability Determinations and Functional Assessments (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- 2D reactor containment fan cooler (RCFC) failed to start in fast speed;
- 0B VC chiller surveillance results determined to be invalid;
- 1A RCFC did not transfer to slow speed within required time limits;
- Westinghouse Nuclear Safety Advisory Letter(NSAL) identified a potential reactor coolant pump structural issue;
- 1C main steam isolation valve (MSIV) standby accumulator leaking nitrogen; and
- Unanalyzed consequence from the postulated main steam line break outside containment event (Operability Evaluation 17-001, Rev. 0).

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 Technical Specifications (TSs) and Updated Final Safety Analysis Report (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 reviewed a sample of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations.

This operability inspection constituted six samples as defined in IP 71111.15–05.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

.1 Post-Maintenance Testing

a. Inspection Scope

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

- 0A essential service water (SX) makeup pump failed to start;
- 1A RCFC time delay relay replacement after the fan did not transfer to slow speed within required time limits;
- 1C MSIV accumulator recharge and nitrogen leak repair;
- 1A steam generator power operated relief valve (PORV) controller repair; and
- 0B SX makeup pump recirculation line through-wall leak.

These activities were selected based upon the SSC's ability to impact risk. The inspectors evaluated these activities for the following; 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 the TSs, the UFSAR, 10 CFR Part 50 requirements, and licensee procedures 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.

This inspection constituted five post-maintenance testing sample as defined in IP 71111.19–05.

b. Findings

No findings 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:

- 1BOSR FW-SA1, Anticipated Transient Without SCRAM Mitigating System at Power Surveillance (Routine);
- 1BOSR 5.5.8.CS.5-1c, Comprehensive Inservice Testing (IST) Requirements for Containment Spray Pump 1CS01PA (IST); and
- 1BOSR 3.2.8-644A, ESFAS Instrumentation Slave Relay Surveillance (Train "A" Automatic Containment Spray - K644) (Routine).

The inspectors observed in-plant activities and reviewed procedures and associated records to determine 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, sufficient to demonstrate operational readiness, and consistent with the system design basis;
- was plant equipment calibration correct, accurate, and properly documented;
- were as-left setpoints within required ranges; and was the calibration frequency in accordance with TSs, the UFSAR, plant procedures, and applicable commitments;
- was measuring and test equipment calibration current;
- was the test equipment used within the required range and accuracy, and were applicable prerequisites described in the test procedures satisfied;
- did test frequencies meet TS requirements to demonstrate operability and reliability;
- were tests performed in accordance with the test procedures and other applicable procedures;
- were jumpers and lifted leads controlled and restored where used;
- were test data and results accurate, complete, within limits, and valid;
- was test equipment removed following testing;
- where applicable for IST activities, was testing performed in accordance with the applicable version of Section XI of the ASME Code and were reference values consistent with the system design basis;
- was the unavailability of the tested equipment appropriately considered in the performance indicator (PI) data;
- were test results not meeting acceptance criteria addressed with an adequate operability evaluation or was the system or component declared inoperable;

- was the reference setting data accurately incorporated into the test procedure;
- was equipment returned to a position or status required to support the performance of its safety functions following testing;
- were problems identified during the testing appropriately documented and dispositioned in the licensee's corrective action program (CAP);
- were annunciators and other alarms demonstrated to be functional and were setpoints consistent with design requirements; and
- were alarm response procedure entry points and actions consistent with the plant design and licensing documents.

This inspection constituted two routine surveillance testing samples and one in-service test sample as defined in IP 71111.22, Sections-02 and-05.

b. Findings

No findings were identified.

**2. RADIATION SAFETY**

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

.1 Walkdowns and Observations (02.02)

a. Inspection Scope

The inspectors walked down select effluent radiation monitoring systems to evaluate whether the monitor configurations aligned with Offsite Dose Calculation Manual (ODCM) descriptions and to observe the material condition of the systems.

The inspectors walked down selected components of the gaseous and liquid discharge systems to evaluate whether equipment configuration and flow paths aligned with plant documentation and to assess equipment material condition. The inspectors also assessed whether there were potential unmonitored release points, building alterations, which could impact effluent controls, and ventilation system leakage that communicated directly with the environment.

For equipment or areas associated with the systems selected for review that were not readily accessible, the inspectors reviewed the licensee's material condition surveillance records.

The inspectors walked down filtered ventilation systems to assess for conditions such as degraded high-efficiency particulate air/charcoal banks, improper alignment, or system installation issues that would impact the performance or the effluent monitoring capability of the effluent system.

As available, the inspectors observed selected portions of the routine processing and discharge of radioactive gaseous effluent to evaluate whether appropriate treatment equipment was used and the processing activities aligned with discharge permits.

The inspectors determined if the licensee has made significant changes to their effluent release points.

As available, the inspectors observed selected portions of the routine processing and discharging of liquid radioactive waste to determine if appropriate effluent treatment equipment was being used and that radioactive liquid waste was being processed and discharged in accordance with procedure requirements and aligned with discharge permits.

These inspection activities constituted one sample as defined in IP 71124.06–05.

b. Findings

No findings were identified.

.2 Calibration and Testing Program (02.03)

a. Inspection Scope

The inspectors reviewed calibration and functional tests for select effluent monitors to evaluate whether they were performed consistent with the ODCM. The inspectors assessed whether National Institute of Standards and Technology traceable sources were used, primary calibration represented the plant nuclide mix, secondary calibrations verified the primary calibration, and calibration encompassed the alarm set points.

The inspectors assessed whether effluent monitor alarm set points were established as provided in the ODCM and procedures.

The inspectors evaluated the basis for changes to effluent monitor alarm set points.

These inspection activities constituted one sample as defined in IP 71124.06–05.

b. Findings

No findings were identified.

.3 Sampling and Analyses (02.04)

a. Inspection Scope

The inspectors reviewed select effluent sampling activities and assessed whether adequate controls had been implemented to ensure representative samples were obtained.

The inspectors reviewed select effluent discharges made with inoperable effluent radiation monitors and assess whether controls were in place to ensure compensatory sampling was performed consistent with the ODCM and that those controls were adequate to prevent the release of unmonitored effluents.

The inspectors determined whether the facility was routinely relying on the use of compensatory sampling in lieu of adequate system maintenance.

The inspectors reviewed the results of the inter-laboratory comparison program to evaluate the quality of the radioactive effluent sample analyses and assessed

whether the inter-laboratory comparison program included hard-to-detect isotopes as appropriate.

These inspection activities constituted one sample as defined in IP 71124.06–05.

b. Findings

No findings were identified.

.4 Instrumentation and Equipment (02.05)

a. Inspection Scope

The inspectors reviewed the methodology used to determine the effluent stack and vent flow rates to determine if the flow rates were consistent with plant documentation, and whether differences between assumed and actual stack and vent flow rates affected the results of the projected public doses.

The inspectors assessed whether surveillance test results for TS required ventilation effluent discharge systems met TS acceptance criteria.

The inspectors assessed calibration and availability for select effluent monitors used for triggering emergency action levels or for determining protective action recommendations.

These inspection activities constituted one sample as defined in IP 71124.06–05.

b. Findings

No findings were identified.

.5 Dose Calculations (02.06)

a. Inspection Scope

The inspectors reviewed significant changes in reported dose values compared to the previous radiological effluent release report to evaluate the factors which may have resulted in the change.

The inspectors reviewed radioactive liquid and gaseous waste discharge permits to assess whether the projected doses to members of the public were accurate.

The inspectors evaluated the isotopes that were included in the source term to assess whether analysis methods were sufficient to satisfy detectability standards. The review included the current Part 61 analyses to ensure hard-to-detect radionuclides were included in the source term.

The inspectors reviewed changes in the licensee's offsite dose calculations to evaluate whether changes were consistent with the ODCM and Regulatory Guide 1.109. The inspectors reviewed meteorological dispersion and deposition factors used in the ODCM and effluent dose calculations to evaluate whether appropriate factors were being used for public dose calculations.



The inspectors reviewed the latest Land Use Census to assess whether changes had been factored into the dose calculations.

For select radioactive waste discharges, the inspectors evaluated whether the calculated doses were within the Title 10 of the *Code of Federal Regulations* (CFR) Part 50, Appendix I and TS dose criteria.

The inspectors reviewed select records of abnormal radioactive waste discharges to ensure the discharge was monitored by the discharge point effluent monitor. Discharges made with inoperable effluent radiation monitors, or unmonitored leakages were reviewed to ensure that an evaluation was made to account for the source term and projected doses to the public.

These inspection activities constituted one sample as defined in IP 71124.06–05.

b. Findings

No findings were identified.

.6 Problem Identification and Resolution (02.07)

a. Inspection Scope

Inspectors assessed whether problems associated with the effluent monitoring and control program were being identified by the licensee at an appropriate threshold and were properly addressed for resolution. In addition, the inspectors evaluated the appropriateness of the corrective actions for a selected sample of problems documented by the licensee involving radiation monitoring and exposure controls.

These inspection activities constituted one sample as defined in IP 71124.06–05.

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (71124.07)

.1 Site Inspection (02.02)

a. Inspection Scope

The inspectors walked down select air sampling stations and dosimeter monitoring stations to determine whether they were located as described in the ODCM and to assess equipment material condition.

The inspectors reviewed calibration and maintenance records for select air samplers, dosimeters, and composite water samplers to evaluate whether they demonstrated adequate operability of these components.

The inspectors assessed whether the licensee had initiated sampling of other appropriate media upon the loss of a required sampling station.

The inspectors observed the collection and preparation of environmental samples from select environmental media to determine if environmental sampling was representative of the release pathways specified in the ODCM and if sampling techniques were in accordance with procedures.

The inspectors assessed whether the meteorological instruments were operable, calibrated, and maintained in accordance with guidance contained in the Final Safety Analysis Report, U.S. Nuclear Regulatory Commission (NRC) Regulatory Guide 1.23, "Meteorological Monitoring Programs for Nuclear Power Plants," and licensee procedures. The inspectors assessed whether the meteorological data readout and recording instruments were operable.

The inspectors evaluated whether missed and/or anomalous environmental samples were identified and reported in the annual environmental monitoring report. The inspectors selected events that involved a missed sample, inoperable sampler, lost dosimeter, or anomalous measurement to determine if the licensee had identified the cause and had implemented corrective actions. The inspectors reviewed the licensee's assessment of any positive sample results and reviewed any associated radioactive effluent release data that was the source of the released material.

The inspectors selected structures, systems, or components that involved or could reasonably involve a credible mechanism for licensed material to reach groundwater, and assessed whether the licensee had implemented a sampling and monitoring program sufficient to detect leakage to groundwater.

The inspectors evaluated whether records important to decommissioning, as required by 10 CFR Part 50.75(g), were retained in a retrievable manner.

The inspectors reviewed any significant changes made by the licensee to the ODCM as the result of changes to the land census, long-term meteorological conditions, or modifications to the sampler stations since the last inspection. The inspectors reviewed technical justifications for any changed sampling locations to evaluate whether the licensee performed the reviews required to ensure that the changes did not affect the ability to monitor the impact of radioactive effluent releases on the environment.

The inspectors assessed whether the appropriate detection sensitivities with respect to the ODCM were used for counting samples. The inspectors reviewed the quality control program for analytical analysis.

The inspectors reviewed the results of the licensee's inter-laboratory comparison program to evaluate the adequacy of environmental sample analyses performed by the licensee. The inspectors assessed whether the inter-laboratory comparison test included the media/nuclide mix appropriate for the facility. The inspectors reviewed the licensee's determination of any bias to the data and the overall effect on the radiological environmental monitoring program.

These inspection activities constituted one sample as defined in IP 71124.07-05.

b. Findings

No findings were identified.

.2 Groundwater Protection Initiative Implementation (02.03)

a. Inspection Scope

The inspectors reviewed monitoring results of the groundwater protection initiative (GPI) to evaluate whether the licensee had implemented the program as intended and to assess whether the licensee had identified and addressed anomalous results and missed samples.

The inspectors evaluated the licensee's implementation of the minimization of contamination and survey aspects of the GPI and the Decommissioning Planning Rule requirements in 10 CFR 20.1406 and 10 CFR 20.1501.

The inspectors reviewed leak and spill events and 10 CFR 50.75 (g) records and assessed whether the source of the leak or spill was identified and appropriately mitigated.

The inspectors assessed whether unmonitored leaks and spills were evaluated to determine the type and amount of radioactive material that was discharged. The inspectors assessed whether the licensee completed offsite notifications in accordance with their procedures.

The inspectors reviewed evaluations of discharges from onsite contaminated surface water bodies and the potential for groundwater leakage from them. The inspectors assessed whether the licensee properly accounted for these discharges as part of the effluent release reports.

The inspectors assessed whether onsite groundwater sample results and descriptions of any significant onsite leaks or spills into groundwater were documented in the Annual Radiological Environmental Operating Report or the Annual Radiological Effluent Release Report.

The inspectors determined if significant new effluent discharge points were updated in the ODCM and the assumptions for dose calculations were updated as needed.

These inspection activities constituted one sample as defined in IP 71124.07-05.

b. Findings

No findings were identified

.3 Problem Identification and Resolution (02.04)

a. Inspection Scope

The inspectors assessed whether problems associated with the radiological environmental monitoring program were being identified by the licensee at an appropriate threshold and were properly addressed for resolution. The inspectors assessed the appropriateness of the corrective actions for a selected sample of problems documented by the licensee that involved the radiological environmental monitoring program.

These inspection activities constituted one sample as defined in IP 71124.07–05.

b. Findings

No findings were identified.

**4. OTHER ACTIVITIES**

4OA1 Performance Indicator Verification (71151)

**Cornerstones: Mitigating Systems, Public Radiation Safety, and Occupational Radiation Safety**

.1 Mitigating Systems Performance Index – Heat Removal System

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index (MSPI) – Heat Removal System performance indicator (PI) for Byron Units 1 and 2 for the period from the third quarter 2016 through the second quarter 2017. The inspectors used guidance contained in the Nuclear Energy Institute (NEI) 99–02, “Regulatory Assessment PI Guideline,” Revision 7, dated August 2013, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee’s operator narrative logs, issue reports (IRs), event reports, MSPI derivation reports, and NRC Integrated Inspection Reports for the period July 1, 2016 through June 30, 2017 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, whether the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee’s IR database to determine if any problems had been identified with the PI data collected or transmitted for this indicator.

This inspection constituted two MSPI heat removal system samples as defined in IP 71151–05.

b. Findings

No findings were identified.

## .2 Mitigating Systems Performance Index – Cooling Water Systems

### a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index – Cooling Water Systems PI for Byron Units 1 and 2 for the period from the third quarter 2016 through the second quarter 2017. The inspectors used guidance contained in the NEI 99–02, “Regulatory Assessment PI Guideline,” Revision 7, dated August 2013, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee’s operator narrative logs, IRs, MSPI derivation reports, event reports and NRC Integrated Inspection Reports for the period July 1, 2016 through June 30, 2017 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, whether the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee’s IR database to determine if any problems had been identified with the PI data collected or transmitted for this indicator.

This inspection constituted two MSPI cooling water system samples as defined in IP 71151–05.

### b. Findings

No findings were identified.

## .3 Reactor Coolant System Specific Activity

### a. Inspection Scope

The inspectors sampled licensee submittals for the reactor coolant system specific activity PI for Byron Units 1 and 2 for the period from the first quarter 2016 through the second quarter 2017. The inspectors used guidance contained in NEI 99–02, “Regulatory Assessment PI Guideline,” Revision 7, dated August 2013, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee’s reactor coolant system chemistry samples, Technical Specifications (TS) requirements, IRs, event reports and NRC Integrated Inspection Reports to validate the accuracy of the submittals. The inspectors also reviewed the licensee’s IR database to determine if any problems had been identified with the PI data collected or transmitted for this indicator. In addition to record reviews, the inspectors observed a chemistry technician obtain and analyze a reactor coolant system sample.

This inspection constituted two reactor coolant system specific activity samples as defined in IP 71151–05.

### b. Findings

No findings were identified.

.4 Radiological Effluent Technical Specification/Offsite Dose Calculation Manual  
Radiological Effluent Occurrences

a. Inspection Scope

The inspectors sampled licensee submittals for the radiological effluent Technical Specification/ODCM radiological effluent occurrences PI for Byron Units 1 and 2 for the period from the second quarter 2016 through the second quarter 2017. The inspectors used guidance contained in NEI 99-02, "Regulatory Assessment PI Guideline," Revision 7, dated August 2013, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee's IR database and selected individual reports generated since this indicator was last reviewed to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. The inspectors reviewed gaseous effluent summary data and the results of associated offsite dose calculations for selected dates to determine if indicator results were accurately reported. The inspectors also reviewed the licensee's methods for quantifying gaseous and liquid effluents and determining effluent dose.

This inspection constituted one Radiological Effluent Technical Specification/Offsite Dose Calculation Manual radiological effluent occurrences sample as defined in IP 71151-05.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

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

a. Inspection Scope

As discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify they were being entered into the licensee's corrective action program (CAP) at an appropriate threshold, adequate attention was being given to timely corrective actions, and adverse trends were identified and addressed. Some minor issues were entered into the licensee's CAP as a result of the inspectors' observations; however, they are not discussed in this report.

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.

b. Findings

No findings were identified.

.2 Annual Follow-up of Selected Issues: Gas Voids in Auxiliary Feedwater Suction Piping

a. Inspection Scope

The inspectors selected the following IR for an in-depth review:

- IR 02658130, Void Identified in 1B Auxiliary Feedwater (AF) Suction Piping

This IR was selected due to the potential negative impact of void formation in safety significant systems such as auxiliary feedwater that could prevent fulfillment of a safety function or degrade system integrity.

The inspectors verified the following attributes during their review of the licensee's corrective actions for the above IR and other related IRs:

- complete and accurate identification of the problem in a timely manner commensurate with its safety significance and ease of discovery;
- evaluation and disposition of operability/functionality/reportability issues;
- classification and prioritization of the resolution of the problem commensurate with safety significance;
- identification of corrective actions, which were appropriately focused to correct the problem; and
- completion of corrective actions in a timely manner commensurate with the safety significance of the issue.

The inspectors discussed the corrective actions and associated evaluations with licensee personnel.

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

b. Observations and Assessments

No performance weaknesses were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On October 11, 2017, the inspectors presented the inspection results to Mr. T. Chalmers, Acting Site Vice President. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

.2 Interim Exit Meetings

Interim exits were conducted for:

The inspection results for the Radiation Safety Program review with Mr. T. Chalmers, Plant Manager, on August 18, 2017.

The inspectors confirmed that none of the potential report input discussed was considered proprietary. Proprietary material received during the inspection was returned to the licensee.

ATTACHMENT: SUPPLEMENTAL INFORMATION



## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

T. Chalmers, Acting Site Vice President  
H. Welt, Operations Director  
D. Spitzer, Regulatory Assurance Manager  
G. Armstrong, Organizational Effectiveness Manager  
T. Faley, Maintenance Director  
Z. Cox, Regulatory Assurance  
P. Boyle, Acting Plant Manager  
C. Keller, Engineering Director  
B. Barton, Radiation Protection Manager  
D. Gullott, Licensing Manager, Exelon Nuclear  
R. Sprengle, Senior Regulatory Engineer, Exelon Nuclear

#### U.S. Nuclear Regulatory Commission

E. Duncan, RIII Branch 3 Chief, Division of Reactor Projects  
J. McGhee, Byron Senior Resident Inspector  
C. Hunt, Byron Resident Inspector  
J. Lara, RIII Deputy Director, Division of Reactor Projects

#### Illinois Emergency Management Agency (IEMA)

C. Thompson, Resident Inspector, IEMA  
C. Settles, IEMA

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None

## LIST OF DOCUMENTS REVIEWED

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

### 1R04 Equipment Alignment

- M-66, Sheets 1-4; Diagram of Component Cooling (Unit 1 & 2)
- M-139, Sheets 1 & 2; Diagram of Component Cooling (Unit 2)
- Clearance Order 141401; 1CC4912B Stem Lube
- WO 1733982; MM Perform Stem Lube/Gear Case – 1CC9412B
- BOP CC-M1, Revision 027; Component Cooling System Valve Lineup (Unit 1)
- BOP CC-M2, Revision 022; Component Cooling System Valve Lineup (Unit 2)
- M-152, Sheet 9, Revision AB; Manufacturer's Supplemental Diagram of Diesel Generator Lube Oil Schematic
- M-152, Sheet 10, Revision AD; Manufacturer's Supplemental Diagram of Diesel Generator Fuel Oil Schematic
- M-152, Sheet 14, Revision 2; Manufacturer's Supplemental Diagram of Diesel Generator Jacket Water Schematic
- M-152, Sheet 18, Revision R; Diagram of Starting Air
- 2BOSR 7.8.1-1, Revision 21; Unit Two Essential Service Water System Valve Position Monthly Surveillance
- M-96, Sheet 1, Diagram of Control Room HVAC System
- IR 04028557, 0A WO Pump Seal Leak
- IR 2731840, 0A VC Chiller Non-Condensable Vent Path Not Working Correct
- IR 04053548, As Found – Excessive Corrosion on Line 0WO04AA-6" – Aux Building

### 1R05 Fire Protection

- Pre-Fire Plan FZ 11.4C-0, Revision 2; Auxiliary Building 383'-0" Elevation, Auxiliary Building Remote Shutdown and Radwaste
- Pre-Fire Plan FZ 11.3-2, Revision 3; Auxiliary Building 364'-0" Elevation, Unit 2 Containment Pipe Penetration Area
- Pre-Fire Plan FZ 5.4-1. Revision 4; Auxiliary Building 451'-0" Elevation, Division 12 Miscellaneous Electrical Equipment and Battery Room
- Pre-Fire Plan FZ 5.6-1. Revision 4; Auxiliary Building 451'-0" Elevation, Division 11 Miscellaneous Electrical Equipment and Battery Room
- IR 04040002; Crew C Third Quarter Fire Drill
- Pre-Fire Plan FZ 18.3-1 Miscellaneous Area 377' 0" Elevation Unit 1 Main Steam & Auxiliary Feedwater Pipe Tunnel
- Pre-Fire Plan FZ 11.6-1 Unit 1 Auxiliary Building 426'-0" Elevation – Division 12 Electrical Penetration Area
- Pre-Fire Plan FZ 11.6-2 Unit 2 Auxiliary Building 426'-0" Elevation – Division 22 Electrical Penetration Area.

### 1R07 Heat Sink Performance

- IR 04034706; 1SX2082B Is Difficult to Operate

- IR 04034710; 1SX2183B Is Difficult to Operate
- IR 04034695; Valve Bar Needed to Move 1SX091B
- WO 01880316; Support Eddy Current Testing for 1B CS Pump Cubicle Cooler
- WO 01082826; Contingency Task for 1B CS Cubicle Cooler Repairs
- IR 04036481; 1B CS Cubicle Cooler Isolation Valves Leak By After Repair
- ER-AA-340, Revision 8; GL 89-13 Program Implementing Procedure
- ER-AA-340-1001, Revision 10; GL 89-13 Program Implementation Instructional Guide

#### 1R11 Licensed Operator Regualification Program

- Scenario Guide for Crew Evaluation on September 12, 2017
- WO 1920628; Main Steam Safety Valves Operability Test
- 2BVSr 7.1.1-1, Revision 12; Unit 2 Main Steam Safety Valves Operability Test

#### 1R12 Maintenance Effectiveness

- IR 02528568; Perform Aggregate Review of AR/PR System
- IR 03984306; RMS Loop 3 Loss of Communication
- IR 03984265; OPR05J Communications Failure
- IR 03984306; RMS Loop 3 Loss of Communication
- a(2) Determination for System PR-08 (Provide PR System Communication Between the Safety Related and Non Safety Related PR Skids and Main Control Room)
- a(2) Determination for System PR-07 (Radioactive Liquid and Gaseous Effluent Monitors, Including Automatic Actuations as Required)
- MR Function Evaluation for SA-01 (Supply Station Air to the Instrument Air System)
- IR 03958440; Unexpected MCR Alarms – SA Pressure Low U-1, U-2, and U-0
- IR 03963027; Unit 0 Service Air Received Low Pressure Alarm
- IR 04010442; SAC Trip; SA Low Pressure
- IR 04021086; 2A SAC Trip Due to High Interstage Air Temp
- IR 02731492; 1A SAC Tripped
- IR 02709182; 1B SAC Won't Start Keeps Tripping
- IR 02634178; Results of SA System Health Challenge
- IR 02609169; Aggregate Review of Station Air Compressors
- IR 02520119; Aggregate Review of Station Air Compressors Issues
- IR 02513499; 1A SAC Tripped Immediately After Startup

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

- B2R20 Shutdown Safety Management Plan (SSMP) Dated 08/31/2017

#### 1R15 Operability Evaluations

- IR 04036567; 2D RCFC High Speed Fan Start Aborted Due to Amps
- TS 3.6.6; Containment Spray and Cooling Systems, and Associated Bases
- UFSAR Section 6.2.2.1.1; Reactor Containment Fan Cooler (RCFC) System
- IR 04034999; 0B VC Chiller Surveillance Results Invalid
- WO 01913058; 0B VC Chiller Performance Verification Test
- TS 3.7.11; Control Room Ventilation (VC) Temperature Control System, and Associated Bases
- WO 01766973; 0B VC Chiller Performance Verification Test
- IR 04038849; Westinghouse NSAL Identifies Potential RCP Structural Issue

- NSAL-17-3, Westinghouse Model 93A Reactor Coolant Pump Casing and Support Foot Structural Announcement; Dated July 27, 2017
- IR 04039037; 1A RCFC Failed to Start Within 33 Seconds
- 1BOSR 3.2.8-610A; Unit One ESFAS Instrumentation Slave Relay Surveillance and Automatic Actuation Test (Train A Automatic Safety Injection – K610)
- TS 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation, and Associated Bases
- Drawing 6E-1-4030VP01, Revision S; Schematic Diagram Reactor Containment Fan Cooler 1A – Low Speed 1VP01CA
- Drawing 6E-1-4030VP02, Revision T; Schematic Diagram Reactor Containment Fan Cooler 1A – High Speed 1VP01CA
- IR 04040294; 1C MSIV Standby Accumulator Pressure Low
- IR 04040815; 1C MSIV Re-Work Active Nitrogen Manifold to Accumulator Joint
- IR 04041112; 1C MSIV Standby Alarm Coming in Early
- IR 04041587; 1C MSIV Low Pressure Alarm Continues to Toggle
- IR 04041886; 1C MSIV Standby Accumulator End Cap Leakage at Threads
- IR 04045174; Did Not Receive 1-1-D5 [1C MSIV Accumulator Pressure Hi/Lo Alarm]
- IR 04045889; 1C MSIV Active Accumulator End Cap Leakage at Threads
- IR 04045898; 1C MSIV Accumulator 1MS001C-A has a N2 Leak in the Bottom Plug
- Drawing M-152 Sheet Number 57; Manufacturer's Schematic Diagram for A/DV Self Contained Hydraulic Actuator
- WO 04673488; 1C MSIV Active Side Nitrogen Manifold to Accumulator Joint Degraded
- IR 04049814; Unanalyzed Consequence From the MSLB Outside Containment
- EC 621194; Operability Evaluation 17-001, Rev. 0 – Unanalyzed Consequence from the MSLB Outside Containment

#### 1R19 Post Maintenance Testing

- IR 04029120; 0A SX M/U Pump Failed to Start
- IR 04030584; 0A SX MU Pump Fuel Leak
- IR 04036065; WO for 0A SX Diesel Fuel Line Replacements
- IR 04036066; WO for 0B SX Diesel Fuel Line Replacements
- WO 04660080; 0A SX M/U Pump Failed to Start
- VTIP D302-0050; Detroit Diesel V-71 Service Manual- Fuel System
- IR 04031494; EOC [Extent of Condition] for 0B SX M/U Pump Fuel Return Line
- IR 04039037; 1A RCFC Failed to Start Within 33 Seconds
- WO 04671098; 1A RCFC Failed to Start Within 33 Seconds
- Drawing 6E-1-4630B, Revision U; Internal/External Wiring Diagram 480V ESF Switchgear 131X 1AP10E Section 1
- WO 04625680; Recharge As Required
- WO 04674336; 1C MSIV Standby Accumulator End Cap Leakage at Threads
- Drawing M-152 Sheet Number 57; Manufacturer's Schematic Diagram for A/DV Self Contained Hydraulic Actuator
- IR 04048820; LED #5 (Inhibit LED) Lit for 1A PORV
- WO 04681386; LED #5 (Inhibit LED) Lit for 1A PORV
- IR 04054456; Through Wall Leak 0B SX Makeup Pump Recirc Line
- WO 04689496; Through Wall Leak 0B SX Makeup Pump Recirc Line

## 1R22 Surveillance Testing

- WO 04587131; 1BOSR FW-SA1, Anticipated Transient Without SCRAM Mitigating System at Power Surveillance
- IR 04029611; 1BOSR FW-SA1 Timing Not Acceptable (AMS)
- WO 04652593; 1BOSR 3.2.8-644A, ESFAS Instrumentation Slave Relay Surveillance (Train A Automatic Containment Spray – K644)
- WO 04654014; 1BOSR 5.5.8.CS.5-1c, Comprehensive Inservice Testing (IST) Requirements for Containment Spray Pump 1CS01PA

## 2RS6 Radioactive Gaseous and Liquid Effluent Treatment

- AR-04043073; NRC/RETS/REMP Inspection Issues with Air Sampler Location; Dated August 16, 2017
- AR-04043092; NRC/REMP Inspection Well Water/Groundwater Versus Drinking Water Sampling Characterization; Dated August 16, 2017
- AR-04041165; Improper Orientation Used for Counting Samples that Affected ODCM Effluent Discharges; Dated August 9, 2017
- Byron 2017-0029; 2016 Annual Radioactive Effluent Release Report; Dated April 20, 2017
- AR-04033481; Standing Water Found in CW Blowdown Vaults 1, 4 and 6; Dated July 19, 2017
- AR-03967450; 1PR28J Unit-1 Vent Stack Monitor Gas High Channel in Alarm; Dated January 27, 2017
- AR-03949520; Unexpected Alarm 1PR30J Aux Building Gas Monitor Check Source Test Failure; Dated December 5, 2016
- AR-03950402; Adverse Trend in 1PR30J High-Level Gas Channel due to Stuck Check Source; Dated October 1, 2016
- AR-03956451; Unexpected Alarm 1PR30J Check Test Failure; Dated December 25, 2016
- AR-03984014; 1PR30J Monitor Instrument Failure; Dated March 10, 2017
- AR-02713991; Unexpected Alarm Check Source Failure 2PR28J
- AR-02740093; 2PR28J High Gas Channel Check Source Needs Replacement; Dated November 11, 2016
- RP-BY-900-2PR11J; 2PR11J Containment Atmosphere Process Radiation Monitor Radiological Air Sampling; Revision 9; Dated August 15, 2017
- RP-BY-900-2PR29J; 2PR29J Wide Range Gas Monitor Process Radiation Monitor Radiological Air Sampling; Revision 10; Dated August 16, 2017
- Permit Number 2017192; BCP 400-TCNMT/Routine; Gaseous Effluent Release Form; Revision 28; Containment Purge; Dated May 5, 2017
- Permit Number 2017142; BCP 400-TCNMT/Routine; Gaseous Effluent Release Form; Revision 28; Containment Purge; Dated March 29, 2017
- Permit Number 2016427; BCP 400-TCNMT/ALT; Gaseous Effluent Release Form; Alternate Containment Release 1PR001 Skid Not Operable; Revision 23; Dated October 25, 2016
- Permit Number 2016090; Liquid Pre-Release Permit Report; BCP 400-TWX26; Liquid Radwaste Release Form for Release Tank 0WX26T; Revision 68; Dated October 15, 2016
- Permit Number 2016077; Liquid Pre-Release Permit Report; BCP 400-TWX26; Liquid Radwaste Release Form for Release Tank 0WX26T; Revision 68; Dated September 29, 2016
- LS-AA-104-1001; 50.59 Review Coversheet Form; Revision 3; The Liquid Radiation Monitors; 0PR001J, 0PR005J, 0PR010J, 0PR41J, 1PR002J, 1PR003J, 1PR009J, 2PR002J, 2PR003J, and 2PR009J, Require a Set Point Changes to High Alarm and Alert Alarm Values to Ensure 10 CFR 20 Limits are Not Exceeded; from August 30 2010, through May 13, 2014

- RP-BY-901; ID RP0075; Unit 1 and 2 PR011 Low Gas and Particulate Containment Atmosphere Setpoint Change; Revision 10; Dated December 17, 2014
- BRP-5820-14; Process Radiation Monitor System Alert/High Alarm Setpoint; Revision 44
- ID RP0095; Unit 1 Auxiliary Building Vent Stack Effluent Set Point Verification; Dated December 16, 2011
- BISR 11.a.5-200; Surveillance Calibration of Liquid Effluent Radiation Monitor; Revision 3; Dated January 12, 2016
- NUCON International; Byron Radioiodine Test Report; 0B VA Non Accessible Plenum 0VA05FD; Dated January 24, 2017
- EC-382134; Revision 0; Radiation Protection Department; Process Radiation (PR) Monitor Setpoint Bases Documentation for following Monitors; 1RE-PR001A 2RE-PR001A, 1RE-PR028A, 1RE-PR028B, 1RE-PR028D, 2RE-PR028A, 2RE-PR028B, and 2RE-PR028D

## 2RS7 Radiological Environmental Monitoring Program

- Technical Requirements Manual; 3.12; Radiological Environmental Monitoring; Revision 46
- AR 2451514; RETS/REMP 71124.06 & 71124.07; Dated June 5, 2015
- AR 04022654; REMP – BY-12 1st Quarter of 2017 Composite Tritium Result; Dated June 16, 2017
- AR 03991469; MET Tower Delta-T Readings Questionable; Dated March 30, 2017
- AR 04012131; MET Tower Indications Failed during High Wind Conditions; Dated May 18, 2017
- Field Rotometer Calibration; Serial Number 06W010376; Dated February 10, 2017
- Field Rotometer Calibration; Serial Number 06W010376; Dated May 10, 2017
- Field Rotometer Calibration; Serial Number 06W010376; Dated August 10, 2017
- EN-AA-108; Radiological Groundwater Protection Program; Revision 0
- EN-AA-408-4000; Radiological Groundwater Protection Program Implementation; Revision 8
- CY-BY-170-301; Offsite Dose Calculation Manual for Byron Station, Units 1 and 2; Revision 13
- CY-AA-170-100; Radiological Environmental Monitoring Program; Revision 2
- CY-BY-170-1000; Radiological Environmental Monitoring Program and Meteorological Program Implementation; Revision 8
- 50.75(g) File; Dated November 11, 2016
- Teledyne Brown Engineering Environmental Services; 2015 Annual Quality Assurance Report; Dated May 9, 2016
- Teledyne Brown Engineering Environmental Services; 2016 Annual Quality Assurance Report; Dated April 19, 2017
- Byron Nuclear Generating Station, Units 1 and 2; Annual Radiological Environmental Operating Report; Dated May 2016
- Byron Nuclear Generating Station, Units 1 and 2; Annual Radiological Environmental Operating Report; Dated April 2017
- Annual Report on the Meteorological Monitoring Program at the Byron Nuclear Power Station; 2015
- Annual Report on the Meteorological Monitoring Program at the Byron Nuclear Power Station; 2016
- 2017 HPGE A Priori LLD Tracking Checklist and Supporting Data; Date Not Provided
- Results of Radiochemistry Cross Check Program; 1<sup>st</sup> Quarter of 2017; Dated April 23, 2017
- Results of Radiochemistry Cross Check Program; 4<sup>th</sup> Quarter of 2016; Dated March 23, 2017
- Results of Radiochemistry Cross Check Program; 3<sup>rd</sup> Quarter of 2016; Dated March 23, 2017
- Results of Radiochemistry Cross Check Program; 2<sup>nd</sup> Quarter of 2016; Dated July 14, 2016

- Results of Radiochemistry Cross Check Program; 1<sup>st</sup> Quarter of 2016; Dated July 14, 2016

#### 4OA1 Performance Indicator Verification (71151)

- LS-AA-2090; Monthly Data Elements for NRC Reactor Coolant System (RCS) Specific Activity; Revision 4
- Data Elements Reviewed; January 2016 through April 2017
- LS-AA-2150; Monthly Data Elements for NRC RETS/ODCM Radiological Effluent Occurrences
- Data Elements Reviewed; April 2016 through April 2017
- IR 04040594; MSPI Changes Resulting From PRA Revision
- MSPI Derivation Reports for AF, CC, and SX, for the Period of July 2016 through June 2017
- BY-MSPI-001, Revision 16; Reactor Oversight Program MSPI Basis Document, Byron Nuclear Generating Station
- BY-MSPI-001, Revision 18; Reactor Oversight Program MSPI Basis Document, Byron Nuclear Generating Station
- BY-MSPI-001, Revision 19; Reactor Oversight Program MSPI Basis Document, Byron Nuclear Generating Station
- ER-AA-600-1047, Revision 11; Mitigating Systems Performance Index Basis Document
- LS-AA-2200, Revision 5; Mitigating System Performance Index Data Acquisition & Reporting

#### 4OA2 Problem Identification and Resolution

- IR 02658130, Void Identified in 1B AF Suction Piping
- NEI 09-10 Revision 1; Guidelines for Effective Prevention and Management of System Gas Accumulation
- EC 379027; Evaluation of Potential Gas Accumulation in AF System for SER 02-05
- EC 384393; Review of Voided Pipe Between AF006 and AF017
- MPR -3575, Revision 1; AF Pump Test Methodology
- UFSAR Section 10.4.9; Auxiliary Feedwater Systems
- ER-AA-2009, Revision 1; Managing Gas Accumulation Volume
- IR 1172938; Voided SX to AF Suction
- IR 1194324; Preliminary Results – AF Suction Void Calculations
- Byron Station, Units 1 and 2, NRC Integrated Inspection Report 05000454(455)/2011004
- Braidwood Station, Unit 1 and 2; Byron Station, Units 1 and 2, NRC Special Inspection Team (SIT) Report 05000456(457)/2011012; 05000454(455)/2011015
- IR 04053257; NRC ID - Scaffolding Close Proximity to SR Piping/Equipment
- IR 04050204; Potential Trend in Missed Surveillances/Actions Identified (NRC Identified)
- IR 04056059; Hot Work Not Signed In Causes Unplanned LCOAR
- IR 04059790; NRC ID – Insulation Coming Off of 2A DG Exhaust Muffler
- IR 04059795; NRC ID – Insulation Coming Off of 2B DG Exhaust Muffler
- IR 04059797; NRC ID Support Clamp on Unit 1 A DG Exhaust Pipe is Broken
- IR 04059801; NRC ID Unexpected Items Near 1B DG Air Intake
- IR 04056789; 0B SX Makeup Pump Tripped During Run, No Alarms Received
- IR 04049570; Interval Between Consecutive Inspections Exceeded 75 Minutes
- IR 04045559; STI [Surveillance Test Interval] Evaluation Error Causes SFCP [Surveillance Frequency Change Program] Impact



## LIST OF ACRONYMS USED

AF	Auxiliary Feedwater
ADAMS	Agencywide Documents Access and Management System
CAP	Corrective Action Program
CFR	<i>Code of Federal Regulations</i>
CS	Containment Spray
DG	Diesel Generator
GPI	Groundwater Protection Initiative
IMC	Inspection Manual Chapter
IR	Issue Report
IST	Inservice Testing
MEER	Miscellaneous Electrical Equipment Room
MSIV	Main Steam Isolation Valve
MSPI	Mitigating Systems Performance Index
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
NSAL	Nuclear Safety Advisory letter
PI	Performance Indicator
PORV	Power Operator Relief Valve
RCFC	Reactor Containment Fan Cooler
SFCP	Surveillance Frequency Change Program
STI	Surveillance Test Interval
SX	Essential Service Water
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
VC	Control Room Ventilation
WO	Work Order