



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION I  
2100 RENAISSANCE BOULEVARD, SUITE 100  
KING OF PRUSSIA, PA 19406-2713

January 24, 2018

Mr. Bryan Hanson  
Senior Vice President, Exelon Generation Co., LLC  
President and Chief Nuclear Officer, Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

SUBJECT: OYSTER CREEK NUCLEAR GENERATING STATION – INTEGRATED  
INSPECTION REPORT 05000219/2017004

Dear Mr. Hanson:

On December 31, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Oyster Creek Nuclear Generating Station. On January 10, 2018, the NRC inspectors discussed the results of this inspection with Mr. Timothy Moore, Site Vice President and other members of your staff. The results of this inspection are documented in the enclosed report.

No NRC-identified or self-revealing findings were identified during this inspection.

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 the NRC's Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* (CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Silas R. Kennedy, Chief  
Reactor Projects Branch 6  
Division of Reactor Projects

Docket No. 50-219  
License No. DPR-16

Enclosure:  
Inspection Report 05000219/2017004  
w/Attachment: Supplementary Information

cc w/encl:  
Distribution via ListServ

SUBJECT: OYSTER CREEK NUCLEAR GENERATING STATION – INTEGRATED  
INSPECTION REPORT 05000219/2017004 JANUARY 24, 2018

Distribution: (e-mail)

DDorman, RA  
DLew, DRA  
RLorson, DRP  
DPelton, DRP  
BWellington, DRS  
JYerokun, DRS  
SKennedy, DRP  
SShaffer, DRP  
CSafouri, DRP  
APatel, SRI  
EAndrews, DRP, RI  
KMcKenzie, DRP  
JBowen, RI, OEDO  
RidsNrrPMOysterCreek Resource  
RidsNrrDorLpl1 Resource  
ROPreports Resource

DOCUMENT NAME: G:\DRP\BRANCH6\+++Oyster Creek\OC Inspection Reports 2017\OC Integrated  
Inspection Report Q4 2017 Final.docx  
ADAMS ACCESSION NUMBER: ML18025A456

<input checked="" type="checkbox"/> SUNSI Review		<input checked="" type="checkbox"/> Non-Sensitive <input type="checkbox"/> Sensitive		<input checked="" type="checkbox"/> Publicly Available <input type="checkbox"/> Non-Publicly Available	
OFFICE	RI/DRP	RI/DRP	RI/DRP		
NAME	APatel	SShaffer	SKennedy		
DATE	01/22/18	01/22/18	01/24/18		

OFFICIAL RECORD COPY

**U.S. NUCLEAR REGULATORY COMMISSION**

## REGION I

Docket No. 50-219

License No. DPR-16

Report No. 05000219/2017004

Licensee: Exelon Nuclear

Facility: Oyster Creek Nuclear Generating Station

Location: Forked River, New Jersey

Dates: October 1, 2017 – December 31, 2017

Inspectors: A. Patel, Senior Resident Inspector  
E. Andrews, Resident Inspector  
H. Anagnostopoulos, Senior Health Physicist  
J. DeBoer, Emergency Preparedness Inspector  
B. Dionne, Health Physicist  
E. H. Gray, Senior Reactor Inspector

Approved By: Silas R. Kennedy, Chief  
Reactor Projects Branch 6  
Division of Reactor Projects

Enclosure

## TABLE OF CONTENTS

<b>SUMMARY .....</b>	<b>3</b>
<b>1. REACTOR SAFETY .....</b>	<b>4</b>
1R01 Adverse Weather Protection .....	4
1R04 Equipment Alignment.....	4
1R05 Fire Protection .....	5
1R07 Heat Sink Performance .....	5
1R11 Licensed Operator Requalification Program and Licensed Operator Performance ...	8
1R12 Maintenance Effectiveness.....	9
1R13 Maintenance Risk Assessments and Emergent Work Control .....	9
1R15 Operability Determinations and Functionality Assessments .....	10
1R18 Plant Modifications .....	10
1R19 Post-Maintenance Testing .....	11
1R22 Surveillance Testing.....	11
1EP4 Emergency Action Level and Emergency Plan Changes .....	12
<b>2. RADIATION SAFETY .....</b>	<b>13</b>
2RS2 Occupational As Low As Is Reasonably Achievable.....	13
2RS3 In-Plant Airborne Radioactivity Control and Mitigation .....	13
<b>4. OTHER ACTIVITIES .....</b>	<b>14</b>
4OA1 Performance Indicator Verification .....	14
4OA2 Problem Identification and Resolution .....	15
4OA3 Follow-Up of Events and Notices of Enforcement Discretion .....	18
4OA6 Meetings, Including Exit.....	18
<b>SUPPLEMENTARY INFORMATION.....</b>	<b>A-1</b>
KEY POINTS OF CONTACT .....	A-1
LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED .....	A-1
LIST OF DOCUMENTS REVIEWED.....	A-2
LIST OF ACRONYMS .....	A-9

**SUMMARY**

IR 05000219/2017004; 10/01/2017 – 12/31/2017; Oyster Creek Nuclear Generating Station Integrated Inspection Report.

This report covered a three-month period of inspection by resident inspectors and announced baseline inspections performed by regional inspectors. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

No findings were identified.

## REPORT DETAILS

### Summary of Plant Status

Oyster Creek began the inspection period at 100 percent power. The unit remained at or near 100 percent power for the inspection period.

## 1. REACTOR SAFETY

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

#### 1R01 Adverse Weather Protection (71111.01 – 1 sample)

##### Readiness for Seasonal Extreme Weather Conditions

##### a. Inspection Scope

The inspectors reviewed Exelon's readiness for the onset of seasonal cold temperatures. The review focused on the intake structure and the emergency diesel generators. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), technical specifications, control room logs, and the corrective action program to determine what temperatures or other seasonal weather could challenge these systems, and to ensure Exelon personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including Exelon's seasonal weather preparation procedure and applicable operating procedures. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during cold weather conditions. Documents reviewed for each section of this inspection report are listed in the Attachment.

##### a. Findings

No findings were identified.

#### 1R04 Equipment Alignment

##### Partial System Walkdowns (71111.04 – 2 samples)

##### a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- No. 1 emergency diesel generator while No. 2 emergency diesel generator was out of service on October 10, 2017
- Containment spray system I while containment spray system II was out of service on October 25, 2017

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, technical specifications, work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted the system's

performance of its intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether Exelon staff had properly identified equipment issues and entered them into the corrective action program for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

1R05 Fire Protection

Resident Inspector Quarterly Walkdowns (71111.05Q – 2 samples)

a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that Exelon controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in the area pre-fire plan, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for out of service, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Reactor building northeast corner room on October 8, 2017
- Reactor building control rod drive pump room on October 8, 2017

b. Findings

No findings were identified.

1R07 Heat Sink Performance

.1 Annual Heat Sink Performance (7111.07A – 1 sample)

a. Inspection Scope

The inspectors reviewed the containment spray system I heat exchangers' readiness and availability to perform its safety functions. The inspectors reviewed the design basis for the component and verified Exelon's commitments to NRC Generic Letter 89-13, "Service Water System Requirements Affecting Safety-Related Equipment." The inspectors reviewed the results of previous inspections of the containment spray system I heat exchangers. The inspectors discussed the results of the most recent inspection with engineering staff and reviewed pictures of the as-found and as-left conditions. The inspectors verified that Exelon initiated appropriate corrective actions for identified deficiencies. The inspectors also verified that the number of tubes plugged within the heat exchanger did not exceed the maximum amount allowed.

b. Findings

No findings were identified.

.2 Triennial Heat Sink Performance (71111.07T – 2 samples)

a. Inspection Scope

Triennial Heat Sink and Heat Exchanger Sample Selection

Based on the Oyster Creek risk ranking of safety-related heat exchangers, past triennial heat sink inspections, recent operational experience, and resident inspector input, the inspectors selected the containment spray system heat exchangers, the reactor building closed cooling water system heat exchangers, the ultimate heat sink, piping, intake screens, pumps and valves, the emergency service water system, chemical corrosion and bio-control, and the isolation condensers for inspection samples.

For the samples selected, the inspectors reviewed the system layout, program reports, daily heat exchanger status and trend flow, differential pressure data, self-assessments, and maintenance methods (inspection, cleaning, maintenance, and performance monitoring) used to ensure heat removal capabilities for the safety-related heat exchangers and ultimate heat sink and compared them to Exelon's commitments made in response to NRC Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment," dated July 18, 1989, and Supplement 1, dated April 4, 1990.

Service Water System (Ultimate Heat Sink Sample)

The inspectors completed an inspection of the service water system in accordance with the applicable steps of Inspection Procedure 71111.07, Sections 02.02(d)(4), 02.02(d)(5), 02.02(d)(6), and 02.02(d)(7). The service water system transfers heat from the reactor building closed cooling water heat exchangers to the intake structure.

The inspectors reviewed recent buried piping inspections to assess the condition and structural integrity of the service water piping. The inspectors reviewed a sample of service water pipe nondestructive examination records, intake structure silt inspections, structures monitoring inspection results, and associated engineering evaluations to ensure that Exelon's staff was appropriately addressing observed degradation in service water piping and the intake structure. The inspectors observed that the service water unavailability was low, and that the system was available to perform its ultimate heat sink safety function. Additionally, a previous plant modification had provided for the use of the emergency service water system as an alternate pathway for service water.

The inspectors reviewed the operation of the service water system. The review included system design changes, system procedures, intake structure operating procedures, abnormal service water operating procedures, loss of the service water intake structure operation procedure, adverse weather condition procedures, and service water leak isolation procedures. The inspectors verified that Exelon's staff was maintaining design drawings, design basis calculations, and operating procedures consistent with their design and licensing basis and that plant operators could reasonably implement the procedures. The inspectors performed a walkdown of the accessible portions of the service water system and the intake structure to verify that instrumentation relied upon by operators for decision making tasks was available and functional.



The inspectors verified that the service water piping had been analyzed to demonstrate resistance to water hammer susceptibility.

Also, the inspectors verified Exelon's in-service test procedures tested for the correct operation of the service water pump discharge check valves, precluding the potential for weak-pump/strong-pump interaction during system operation.

The inspectors reviewed the visual inspection records for recent cleanings of the containment spray system and reactor building closed cooling water heat exchangers, which were performed to verify the structural integrity and fouling condition of the heat exchangers.

The inspectors reviewed Exelon's staff disposition process for active through wall service water piping leaks, including structural evaluations and completed and/or planned corrective actions. Microbiologically induced corrosion has not been evident in service water piping systems at Oyster Creek. Ultrasonic testing examinations were appropriately performed in accordance with American Society of Mechanical Engineers Section XI, Boiler and Pressure Vessel Code, and American Society of Mechanical Engineers Code Case N-513-2. The inspectors concluded that the engineering evaluations and the ultrasonic testing examinations demonstrated that structural integrity was maintained.

The inspectors verified that Exelon's staff established appropriate chemistry procedures to control, detect, and monitor system degradation due to macrofouling of the service water and emergency service water pumps, valves, and piping. Chlorination treatment of the service water system was controlled, monitored, trended, and evaluated to ensure adequate biotic control. The inspectors reviewed the service water system performance testing to verify that the minimum calculated service water flow rates were maintained to essential equipment and met the acceptance criteria in the UFSAR.

The inspectors performed a walkdown of the intake building (including the trash racks, service water pumps, service water traveling water screens, emergency service water pumps, and structural supports) and the accessible areas of the intake building containing service water piping to look for indications of piping leakage and/or degradation. The inspectors verified that intake structure pump bay silt accumulation was monitored, trended, and maintained at an acceptable level. The inspectors interviewed the cognizant system engineers, and reviewed silt deposition inspection records and results of past bay silt measurements.

#### Emergency Service Water System

The inspectors reviewed the emergency service water system and its containment spray heat exchangers in accordance with the applicable steps of Inspection Procedure 71111.07, Sections 02.02(b)(2) and 02.02(c). The containment spray heat exchangers provide cooling to the containment spray system should it be necessary to cool the drywell volume, and as an alternate pathway to the service water system, provides backup capability to cool the torus water during normal plant operation.

The inspectors reviewed the design basis heat removal calculation for a containment spray heat exchanger and sampled a heat balance test used to establish the heat exchanger cleanliness or fouling factor. The inspectors reviewed the design basis heat capacity calculation for this system. The inspectors verified that containment spray heat

exchanger condition and operation were consistent with design assumptions in the plant's heat transfer calculations. The design and operation of the containment spray heat exchangers has been analyzed for potential water hammer effects, and plant operating procedures to assure that the heat exchanger does not experience damage due to water hammer conditions.

#### Isolation Condenser Heat Exchanger (Heat Exchanger Sample)

The inspectors reviewed the isolation condenser heat exchangers in accordance with the applicable steps of Inspection Procedure 71111.07, Sections 02.02(b)(2) and 02.02(c). These two heat exchangers with two tube bundles, in each, provide for reactor system cooling when steam is not producing power and are cooled by the evaporation of water supplied by the demineralization system with a backup supply available from the condensate storage system. The chemistry of the heat exchanger water was maintained at primary water chemistry quality to prevent corrosive degradation. The inspectors reviewed the heat removal capability of the system, the valve lineup for normal and abnormal conditions, and observed the heat exchangers, piping, and valves in the plant.

#### Problem Identification and Resolution

The inspectors selected and reviewed a sample of corrective action program reports related to the heat sink equipment and heat exchanger samples chosen for this inspection. The review verified whether Exelon's staff were appropriately identifying, characterizing, and correcting problems related to these systems and components, and that the planned or completed corrective actions for the reported issues were appropriate.

#### b. Findings

No findings were identified.

### 1R11 Licensed Operator Regualification Program and Licensed Operator Performance (71111.11Q – 1 sample)

#### Quarterly Review of Licensed Operator Regualification Testing and Training

#### a. Inspection Scope

The inspectors observed licensed operator simulator training on October 17, 2017, which included an off gas system deflagration with a loss of a service water pump, seal failure on a reactor recirculation pump, and manual reactor scram. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the technical specification action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 2 samples)a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structure, system, and component performance and reliability. The inspectors reviewed system health reports, corrective action program documents, maintenance work orders, and maintenance rule basis documents to ensure that Exelon was identifying and properly evaluating performance problems within the scope of the maintenance rule. For each sample selected, the inspectors verified that the structure, system, or component was properly scoped into the maintenance rule in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 50.65 and verified that the (a)(2) performance criteria established by Exelon staff was reasonable. As applicable, for structures, systems, and components classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these structures, systems, and components to (a)(2). Additionally, the inspectors ensured that Exelon staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

- Drywell floor and equipment drains on October 18, 2017
- Remote shutdown and local shutdown panels on November 13, 2017

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 5 samples)a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that Exelon performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that Exelon personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When Exelon performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the technical specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- No. 2 emergency diesel generator and startup transformer bank 5 out of service for emergent maintenance on October 9, 2017
- No. 1 emergency diesel generator out of service for planned maintenance on October 16, 2017
- No. 2 emergency diesel generator out of service for planned maintenance on October 26, 2017
- Core spray system I out of service for planned maintenance on November 14, 2017
- 'B' emergency service water pump out of service for planned maintenance on December 12-15, 2017

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 1 sample)

a. Inspection Scope

The inspectors reviewed operability determinations for the No. 1 emergency diesel generator after failure of the No. 2 emergency diesel generator due to a current transformer wire lug failure on October 9, 2017, based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the operability determinations to assess whether technical specification 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 and UFSAR to Exelon's evaluations to determine whether the components or systems were operable. The inspectors confirmed, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 1 sample)

Temporary Modifications

a. Inspection Scope

The inspectors reviewed the temporary modifications in Engineering Change Package 622233, "Alternate method of controlling high pressure feed water heater 1A3 normal and alternate drain control valves," to determine whether the modifications affected the safety functions of systems that are important to safety. The inspectors reviewed 10 CFR 50.59 documentation and post-modification testing results, and conducted field walkdowns of the modifications to verify that the temporary modifications did not degrade the design bases, licensing bases, and performance capability of the affected systems.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 8 samples)a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure were consistent with the information in the applicable licensing basis and/or design basis documents, and that the test results were properly reviewed and accepted and problems were appropriately documented. The inspectors also walked down the affected job site, observed the pre-job brief and post-job critique where possible, confirmed work site cleanliness was maintained, and witnessed the test or reviewed test data to verify quality control hold point were performed and checked and that results adequately demonstrated restoration of the affected safety functions.

- No. 2 emergency diesel generator following wire lug replacement on October 10, 2017
- Startup transformer bank 5 following voltage regulator controller replacement on October 10, 2017
- No. 1 emergency diesel generator following tug testing on October 16, 2017
- No. 2 emergency diesel generator following fuse replacements on October 26, 2017
- Standby gas treatment system following air leak test on November 13, 2017
- Core spray system I following breaker replacement on November 14, 2017
- 'D' recirculation pump following motor preventative maintenance on November 17, 2017
- 'B' emergency service water pump following pump and motor replacement on December 15, 2017

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 4 samples)a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant structures, systems, and components to assess whether test results satisfied technical specifications, the UFSAR, and Exelon procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied.

Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

- 636.4.003, No. 1 emergency diesel generator load test on October 3, 2017 (routine test)
- 607.4.015, Containment spray and emergency service water system II pump operability, in-service test, and containment spray pumps trip on October 25, 2017, (routine test)
- 604.3.001, Reactor building to torus power vacuum breaker test and calibration on November 14, 2017 (routine test)
- 602.4.004, Main steam isolation valve 10% closure test on November 27, 2017, (containment isolation valve test)

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness**

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04 – 1 sample)

a. Inspection Scope

Exelon implemented various changes to the Oyster Creek Emergency Action Levels (EALs), Emergency Plan, and Implementing Procedures. Exelon had determined that, in accordance with 10 CFR 50.54(q)(3), any change made to the EALs, Emergency Plan, and its lower-tier implementing procedures, had not resulted in any reduction in effectiveness of the Plan, and that the revised Plan continued to meet the standards in 50.47(b) and the requirements of 10 CFR Part 50, Appendix E.

The inspectors performed an in-office review of all EAL and Emergency Plan changes submitted by Exelon as required by 10 CFR 50.54(q)(5), including the changes to lower-tier emergency plan implementing procedures, to evaluate for any potential reductions in effectiveness of the Emergency Plan. This review by the inspectors was not documented in an NRC Safety Evaluation Report and does not constitute formal NRC approval of the changes. Therefore, these changes remain subject to future NRC inspection in their entirety. The requirements in 10 CFR 50.54(q) were used as reference criteria.

b. Findings

No findings were identified.

## 2. RADIATION SAFETY

### Cornerstone: Occupational and Public Radiation Safety

#### 2RS2 Occupational As Low As Is Reasonably Achievable (71124.02 – 1 sample)

##### a. Inspection Scope

The inspectors assessed Exelon's performance with respect to maintaining occupational individual and collective radiation exposures as low as is reasonably achievable (ALARA). The inspectors used the requirements contained in 10 CFR 20, Regulatory Guides 8.8 and 8.10, technical specifications, and procedures required by technical specifications as criteria for determining compliance.

##### Verification of Dose Estimates and Exposure Tracking Systems (1 sample)

The inspectors reviewed the current annual collective dose estimate, basis methodology, and measures to track, trend, and reduce occupational doses for ongoing work activities. The inspectors also reviewed ALARA work activity evaluations, exposure estimates, exposure reduction requirements, person-hour estimates, results achieved (dose rate reductions, actual dose), and post-job reviews that were conducted to identify lessons learned. The inspectors reviewed post-job ALARA evaluations for some of the high dose jobs and verified that lessons learned had been entered into Exelon's corrective action program.

##### b. Findings

No findings were identified.

#### 2RS3 In-Plant Airborne Radioactivity Control and Mitigation (71124.03 – 2 samples)

##### a. Inspection Scope

The inspectors reviewed the control of in-plant airborne radioactivity and the use of respiratory protection devices in these areas. The inspectors used the requirements in 10 CFR 20, Regulatory Guides 8.15 and 8.25, NUREG/CR-0041, technical specifications, and procedures required by technical specifications as criteria for determining compliance.

##### Use of Respiratory Protection Devices (1 sample)

The inspectors reviewed the adequacy of Exelon's use of respiratory protection devices in the plant to include applicable ALARA evaluations, respiratory protection device certification, respiratory equipment storage, air quality testing records, and individual qualification records.

### Self-Contained Breathing Apparatus for Emergency Use (1 sample)

The inspectors reviewed the status and surveillance records for three self-contained breathing apparatus' (SCBAs) staged in-plant for use during emergencies, Exelon's SCBA procedures and maintenance and test records, the refilling and transporting of SCBA air bottles, SCBA mask size availability, and the qualifications of personnel performing service and repair for this equipment.

#### b. Findings

No findings were identified.

## 4. **OTHER ACTIVITIES**

### 4OA1 Performance Indicator Verification (71151)

#### .1 Mitigating Systems Performance Index (5 samples)

##### a. Inspection Scope

The inspectors reviewed Exelon's submittal of the Mitigating Systems Performance Index for the following systems for the period of October 1, 2016, through September 30, 2017:

- Emergency Alternating Current Power System
- High Pressure Injection System – Core Spray
- Heat Removal – Isolation Condensers
- Residual Heat Removal – Containment Spray
- Cooling Water System

To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspectors also reviewed Exelon's operator narrative logs, condition reports, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

##### b. Findings

No findings were identified.

#### .2 Occupational Exposure Control Effectiveness (1 sample)

##### a. Inspection Scope

The inspectors sampled Exelon submittals for the occupational exposure control effectiveness performance indicator for the period of October 1, 2016, through September 30, 2017. The inspectors used performance indicator definitions and guidance contained in NEI Document 99-02, Revision 7 to determine the accuracy of the performance indicator data reported. The inspectors reviewed electronic personal dosimetry accumulated dose alarms, dose reports, and dose assignments for any intakes that occurred during the time period reviewed to determine if there were



potentially unrecognized performance indicator occurrences. The inspectors conducted walk-downs of various locked high radiation area and very high radiation area entrances to determine the adequacy of the controls in place for these areas.

b. Findings

No findings were identified.

.3 Radiological Effluent Technical Specification/Offsite Dose Calculation Manual Radiological Effluent Occurrences (1 sample)

a. Inspection Scope

The inspectors sampled Exelon submittals for the radiological effluent technical specifications and Offsite Dose Calculation Manual radiological effluent occurrences performance indicator for the period of October 1, 2016, through September 30, 2017. The inspectors used performance indicator definitions and guidance contained in NEI Document 99-02, Revision 7 to determine if performance indicator data was reported properly. The inspectors reviewed the public dose assessments for the performance indicator for public radiation safety to determine if related data was accurately calculated and reported.

The inspectors reviewed the corrective action program database to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. The inspectors reviewed gaseous and liquid effluent summary data and the results of associated offsite dose calculations to determine if indicator results were accurately reported.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 2 samples)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify Exelon's entered issues into the corrective action program at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. 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 corrective action program and periodically attended condition report screening meetings. The inspectors also confirmed, on a sampling basis, that, as applicable, for identified defects and non-conformances, Exelon performed an evaluation in accordance with 10 CFR 21.

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a semi-annual review of site issues to identify trends that might indicate the existence of more significant safety concerns. As part of this review, the inspectors included repetitive or closely-related issues that may have been documented by Exelon in trend reports, site performance indicators, major equipment problem lists, system health reports, maintenance rule assessments, and maintenance or corrective action program backlogs. The inspectors also reviewed Exelon's corrective action program database for third and fourth quarters of 2017 to assess condition reports written in various subject areas (equipment problems, human performance issues, etc.), as well as individual issues identified during the NRC's daily condition report review.

b. Findings

No findings were identified.

The inspectors evaluated a sample of corrective maintenance backlogs, control room deficiency tags, open operability evaluations, and operator workarounds. The inspectors verified that these issues were addressed within the scope of the corrective action program.

.3 Annual Sample: Use of Portable Radioactive Liquid Storage Tanks in Response to an Off-Normal Event

a. Inspection Scope

The inspectors reviewed Exelon's actions associated with the use of portable liquid storage tanks (i.e., "FRAC" tanks) in response to an unplanned water intrusion on multiple levels in the reactor building on September 22, 2016, as documented in action request 2718867.

The water intrusion was caused by leakage of radioactively contaminated water from the refueling cavity through the primary containment bellows seal during a refueling outage activity. The water overwhelmed the capacity of the chemical waste treatment system to store the water prior to processing. A total of five FRAC tanks were ultimately connected to the radioactive waste system, and water was transferred into the tanks via a fire-hose. The tanks were located outdoors, but within a posted radiologically controlled area. Each tank was positioned within its own temporary leakage containment.

The inspectors assessed Exelon's problem identification threshold, cause analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of Exelon's corrective actions to determine whether Exelon was appropriately identifying, characterizing, and correcting problems associated with this issue, and to determine whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of Exelon's corrective action program and 10 CFR 50, Appendix B, as applicable.

b. Findings and Observations

No findings were identified.

The inspectors determined that the addition of portable FRAC tanks to the chemical waste treatment system involved a temporary facility change that was not described in the UFSAR and was in response to a nonconforming or degraded condition (i.e., an off-normal event with unexpected reactor cavity leakage that overwhelmed the capacity of the radwaste processing system).

10 CFR 50.59(d)(1) requires that "The licensee shall maintain records of changes in the facility, changes in procedures, and of tests and experiments made pursuant to paragraph (c) of this section. These records must include a written evaluation which provides the bases for the determination that the change, test, or experiment does not require a license amendment pursuant to paragraph (c)(2) of this section." The inspectors identified that, contrary to 10 CFR 50.59, no 50.59 evaluation of the acceptability of a temporary change to the Oyster Creek chemical waste treatment system processing facility was made.

Section 4.4 of NEI 96-07, "Guidelines for 10 CFR 50.59 Evaluations," Revision 1, endorsed by the NRC in Regulatory Guide 1.187, titled "Applying 10 CFR 50.59 to Compensatory Actions to Address Nonconforming or Degraded Conditions" specifies that, "If an interim compensatory action is taken to address the condition and involves a temporary procedure or facility change, 10 CFR 50.59 should be applied to the temporary change. The intent is to determine whether the temporary change/compensatory action itself...impacts other aspects of the facility or procedures described in the UFSAR..."

The Oyster Creek UFSAR, Section 15.7.3, "Postulated Radioactive Releases Due to Liquid Tank Failures," describes an accident for which doses for the failure of radioactive liquid storage tanks are estimated at the site boundary.

Oyster Creek Technical Specification 3.6.C provides a limit on the amount of radioactivity allowed in two specific outdoor tanks in order to ensure that the potential dose to a member of the public remains within limits. These tanks are mentioned explicitly because they are located outdoors and are non-seismically qualified.

The inspectors identified Exelon did not follow 10 CFR 50.59(d)(1) because no screening or evaluation was completed to determine that the change does not require a license amendment was conducted for the temporary facility change in September 2016. Also, no records (in the form of work orders or temporary configuration change packages) were generated or maintained for the temporary facility change in September 2016.

Because 10 CFR 50.59 violations could potentially impede or impact the regulatory process, they are evaluated under the NRC's traditional enforcement approach.

The NRC Enforcement Manual, Section 2.1.3.D.5.a, indicates that such violations would be considered more than minor if the activity or change would have required prior NRC review and approval. This type of issue is also described in Appendix E of the Enforcement Manual as "minor changes to requirements" and is considered to be a minor violation. A review of 10 CFR 50.59 screening for a similar use of temporary

FRAC tanks in 2006 (OC-2006-S-0301) indicates that prior NRC review and approval would not have been required and therefore is considered a minor violation. Exelon wrote issue report 4075886 on November 17, 2017, to document and correct this condition.

The inspectors determined that Exelon's corrective actions were appropriate, commensurate with the safety significance of the issue, and timely.

#### 4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 1 sample)

(Closed) Licensee Event Report (LER) 05000219/2016-005-01: Technical Specification Prohibited Condition Caused by One Electromatic Relief Valve Inoperable for Greater than Allowed Outage Time

On September 19, 2016, during the 1R26 refueling outage with the reactor in cold shutdown, as-found testing was performed on all five electromatic relief valves. The 'E' electromatic relief valve failed to open from the main control room and no indication was observed. Upon investigation, the cutout switch in the valve actuator was found stuck in the open position, preventing the solenoid from actuating to open the valve. Exelon determined the cause of the 'E' electromatic relief valve failure to open was due to missing lock washers not installed on the cut-out switch assembly. Without the lock washers installed, the hinge pins interfered with the solenoid frame holes, which created mechanical binding. Based on this information, Exelon concluded that one of the five electromatic relief valves was inoperable longer than the technical specification allowed outage time of 24 hours.

This LER was revised to include additional descriptive information related to the failure of the 'E' electromatic relief valve and subsequent corrective actions. The inspectors reviewed this issue in NRC Inspection Report 05000219/2016004, Section 4OA2 and identified one finding. The inspectors did not identify any violations or new issues during the review of Revision 1 of the LER. This LER is closed.

#### 4OA6 Meetings, Including Exit

On January 10, 2018, the inspectors presented the inspection results to Mr. Timothy Moore, Site Vice President, and other members of the Oyster Creek staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

### **ATTACHMENT: SUPPLEMENTARY INFORMATION**

## SUPPLEMENTARY INFORMATION

### KEY POINTS OF CONTACT

#### Licensee Personnel

T. Moore, Site Vice President  
 M. Gillin, Plant Manager  
 M. Arnao, Director, Maintenance  
 M. Capone, Engineering Manager, Heat Sink Systems  
 M. Chanda, Manager, Emergency Preparedness  
 J. Chrisman, Radiation Protection Technical Services Manager  
 J. Clark, Manager, Environmental/Chemistry  
 D. Capuferri, Maintenance Manager  
 R. Dutes, Regulatory Assurance Specialist  
 G. Flesher, Regulatory Assurance Manager  
 F. Jordan, Reactor Engineering Manager  
 T. Keenan, Manager, Site Security  
 A. Krukowski, Shift Operations Superintendent  
 J. McCarthy, Decommissioning Health Physicist  
 C. Muggleston, System Engineer  
 J. Murphy, Radiological Engineering Manager  
 P. Must, Operations, Fix-It-Now Senior Reactor Operator  
 T. Powell, Senior Regulatory Assurance Specialist  
 J. Renda, Director, Work Management  
 J. Stanley, Director, Engineering  
 S. Swartz, Senior Engineer, Heat Sink Systems  
 C. Symonds, Director, Training  
 J. Wessinger, Director, Operations  
 K. Wolf, Manager, Radiation Protection

#### NJ DEP

V. Gubbi, Nuclear Engineer

### LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

#### Closed

05000219/2016-005-01	LER	Technical Specification Prohibited Condition Caused by One Electromatic Relief Valve Inoperable for Greater than Allowed Outage Time (Section 4OA3)
----------------------	-----	--

## LIST OF DOCUMENTS REVIEWED

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

#### Procedures

322, Service Water System, Revision 92  
 341, Emergency Diesel Generator Operation, Revision 117  
 ABN-32, Abnormal Intake Level, Revision 29  
 OP-OC-108-109-1001, Severe Weather Preparation T&RM for Oyster Creek, Revision 38  
 OP-OC-108-109-1002, Cold Weather Freeze Inspections, Revision 6  
 SY-AA-101-146, Severe Weather Preparation and Response, Revision 2  
 WC-AA-107, Seasonal Readiness, Revision 19

#### Condition Reports

4049507	4069265	4072647	4072645	4077474	4078147
3945043	4033002	4051669	4040969	4064315	4064339
4082062	4082076	4082508			

#### Miscellaneous

Oyster Creek Certification of 2017-2018 Winter Readiness, dated November 15, 2017

### **Section 1R04: Equipment Alignment**

#### Procedures

341, Emergency Diesel Generator Operation, Revision 116  
 310, Containment Spray System Operation, Revision 116

#### Drawings

GE 148F740, Containment Spray System Flow Diagram, Sheet 1, Revision 44

### **Section 1R05: Fire Protection**

#### Procedures

101.2, Oyster Creek Site Fire Protection Program, Revision 73  
 OP-OC-201-008-1011, Reactor Building (-19' Elevation) Northeast Corner Room, Revision 0  
 OP-OC-201-008-1010, Reactor Building (-19' Elevation) CRD Pump Room, Revision 0  
 OP-AA-201,012-1001, High Risk Fire Area Identification, Revision 1  
 OP-OC-201-012-1001, On-line Fire Risk Management, Revision 4  
 ER-AA-600-1069, High Risk Fire Area Information, Revision 4  
 OP-OC-201-008, Oyster Creek Pre-fire Plans, Revision 26

### **Section 1R07: Heat Sink Performance**

#### Procedures

CY-AA-120-400, Closed Cooling Water Chemistry, Revision 19  
 CY-AA-120-4110-F, Oyster Creek Raw Water Treatment and Control, Revision 2  
 CY-AB-120-310, Suppression Pool/Torus Chemistry, Revision 11  
 ER-AA-330-014, Exelon Safety Related (Service Level III) Coatings, Revision 2  
 ER-AA-340, GL 89-13 Program Implementing Procedure, Revision 8  
 ER-AA-340-1001, GL 89-13 Program Implementation Instructional Guide, Revision 10  
 ER-AA-340-1002, Service Water Heat Exchanger Inspection Guide, Revisions 6 and 7

ER-AA-340-2000, Balance of Plant Heat Exchanger Inspection - Testing and Maintenance Guide, Revision 8  
ER-AA-2002, System Health Monitoring, Revision 20  
ER-OC-340-1001, Oyster Creek Generic Letter 89-13 Program Basis Document, Revision 4  
310, Containment Spray System Operation, Revision 116  
SP-9000-06-004, 2000114, Application and Repair of Service level III Coatings, Revision 1

Calculations

C-1302-241-E120-078, Containment Spray Heat Exchanger Performance Evaluation, Revision 1  
C-1302-241-5450-073, Acceptable Containment Spray Heat Exchanger Fouling Resistance, Revision 0  
EXOC005-CALC-002, Design Basis for Containment Spray System, Revision 2

Condition Reports

2469440  
3789901  
4069261  
Containment spray issue reports since 2014 - 5 total  
Reactor building closed cooling water heat exchanger issue reports since 9/1/2014-2017, 6 total  
Service water issue reports, 2014-2017, 4 total

Drawings

BR 2005, Emergency Service Water, Sheet 4, Revisions 86 and 88  
BR 2005, Reactor and Turbine Building Service Water Flow Diagram, Sheet 2, Revisions 90, 109, and 110  
BR 2006, RBCCW System Flow Diagram, Sheet 1, Revision 81  
BR 2006, RBCCW System Flow Diagram, Sheet 2, Revision 44  
BR 2006, RBCCW System Flow Diagram, Sheet 3, Revision 58  
FP SE-5419, Chlorination System Flow, Revision 64  
GE 148F262, Emergency Condenser Flow Diagram, Sheet 1, Revision 55  
GE 148F740, Containment Spray System Flow Diagram, Sheet 1, Revision 44  
H-5753-A, Sulzer Vertical Service Water Pump Drawing  
OCNGS UFSAR, Table 6.2-6, Emergency Service Water Pump description  
GE, Burns and Roe DWG 4030-6, Intake Structure Operating Level Plan  
FWC Drawing 1691-655-20, Emergency Condenser, Outline and Section, Revision E

Maintenance Orders/Work Orders

R2134866    R2190413    4355443

Miscellaneous

EC 621275, Containment Spray System I Heat Transfer Performance Evaluation, dated October 4, 2017  
EPRI NP-7552, Heat Exchanger Performance Monitoring Guidelines, dated December 1991  
CY-OC-120-1102, Auxiliary Plant System Sample and Analysis Schedule, Revision 119  
CY-AA-120-4000, Closed Cooling Water Chemistry Strategic Plan, Attachment 10, Oyster Creek Closed Cooling Water Treatment and Control, Revision 8  
Heat Sink Water Chemistry Data spreadsheet for 2017  
R2096054, 20130131, Intake Structure Underwater inspection-South  
SDBD-OC-241, 2005509 Containment Spray System, Revision 5  
SDBD-OC-532, 2950509, Design Basis document for Emergency Service Water System, Revision 4

Containment Spray Heat Exchanger Heat Transfer Test  
 Containment Spray Heat Exchanger Inspection  
 Emergency Service Water Pressure Tests  
 Reactor Building Closed Cooling Water Heat Exchanger Cleaning  
 Service Water Pump Performance Tests  
 NUREG-1437, Supp. 28, Generic Environmental Impact Statement for License Renewal  
 of Nuclear Power Plants, regarding Oyster Creek, dated June 2006  
 EPRI NP-7552, Heat Exchanger Performance Monitoring Guidelines, dated December 1991

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

#### Procedures

TQ-AA-150, Operator Training Programs, Revision 14  
 TQ-AA-155, Conduct of Simulator Training and Evaluation, Revision 6  
 ABN-2, Recirculation System Failures, Revision 24  
 ABN-18, Service Water Failure Response, Revision 7  
 ABN-25, Off-Gas Deflagration, Revision 8  
 ABN-26, High Main Steam/Off-Gas/Stack Effluent Activity, Revision 9  
 ABN-49, Loss of USS 1B3, Revision 7

#### Condition Reports

4064197

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

#### Procedures

ER-AA-310, Implementation of the Maintenance Rule, Revision 10  
 ER-AA-310-1004, Maintenance Rule – Performance Monitoring, Revision 14  
 ER-AA-310-1005, Maintenance Rule – Dispositioning Between (a)(1) and (a)(2), Revision 7  
 ABN-30, Control Room Evacuation, Revision 31  
 RAP-9XF-1f, Remote SD Trouble, Revision 2  
 346, Operation of the Remote and Local Shutdown Panels, Revision 23  
 680.4.001, Alternate Shutdown Monitoring Instrumentation Channel Check, Revision 13 351.1,  
 Chemical Waste/Floor Drain System Operating Procedure, Revision 149 676.3.003,  
 DW Sump Flow Integrator – Channel Calibration, Revision 14  
 RAP-RB1C(1-8), 1-8 Sump Drywell Floor Drain Sump High Level, Revision 1

#### Condition Reports

4062405	4049087	2723739	2724268	2736153	2722764
2577232	2576056	2682456	2686036	4024219	4052688
2554283	2564371	2564561	2650226	2655148	2663413
3998744	4044378	4063962	4063651		

#### Drawings

3E-611-17-022, Elec. Elem Diagram Control Panel 9XF-Annun, Sheet 1, Revision 1  
 BR E1108, Elementary Diagram Remote Shutdown Panel Transfer Scheme, Sheet 1,  
 Revision 17  
 JC147434, Sumps & Waste Collection System Flow Diagram, Sheet 3, Revision 68

#### Maintenance Orders/Work Orders

R2231461	R2132488	M2403221	M2401317	4349501	4359411
4351272	4349623				



Miscellaneous

Oyster Creek Maintenance Rule Database, updated October 12, 2017

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

WC-AA-101, Online Work Control Process, Revision 27

WC-OC-101-1001, Online Risk Management and Assessment, Revision 21

OP-MA-109-101, Clearance and Tagging, Revision 22

WC-AA-104, Integrated Risk Management, Revision 24

Condition Reports

4060818	4060869	4061089	4060815	4063488	4083791
---------	---------	---------	---------	---------	---------

Maintenance Orders/Work Orders

4694906	4697086	4698176	4391454	4691852	4352978
---------	---------	---------	---------	---------	---------

**Section 1R15: Operability Determinations and Functionality Assessments**Procedures

MA-OC-741-101, Diesel Generator Inspection (24 Month) – Electrical, Revision 15

636.2.009, Diesel Generator Numbers 1 & 2 Protective Relay Surveillance, Revision 21

Condition Reports

4060815	4060818	4060869	4061089	4061093
---------	---------	---------	---------	---------

Maintenance Orders/Work Orders

R2230340

**Section 1R18: Plant Modifications**Procedures

317.1, Feedwater Heaters, Revision 46

CC-AA-102, Design Input and Configuration Change Impact Screening, Revision 30

CC-AA-103, Configuration Change Control for Permanent Physical Plant Changes Revision 30

CC-AA-112, Temporary Configuration Changes, Revision 26

LS-AA-104-1001, 50.59 Review Coversheet Form, Revision 4

Condition Reports

0545233

Maintenance Orders/Work Orders

06483811

Miscellaneous

ECP 622233, Alternate Method of Controlling HP FW Heater 1-A-3 Normal & Alternate Drain Control Valves V-4-16 and V-4-15, Revision 0

**Section 1R19: Post-Maintenance Testing****Procedures**

636.4.013, Diesel Generator #2 Load Test, Revision 56  
 636.4.003, Diesel Generator #1 Load Test, Revision 109  
 651.4.002, Standby Gas Treatment System 15-Minute Run – System 1, Revision 17  
 330, Standby Gas Treatment System, Revision 60  
 610.4.021, Core Spray System 1 Pump Operability and Quarterly In-Service Test, Revision 34  
 607.4.004, Containment Spray and Emergency Service Water Pump System 1 Operability and Comprehensive/Preservice/Post-Maintenance Inservice Test, Revision 103

**Condition Reports**

4061186	4061089	4061093	4060818	4061515	4061517
4063488	4067437	4067457	4067472	4067479	4067868
4067238	4074238	2724123	2724121	4074537	4082410
4082330	4083409	4082410	4082330	4084418	

**Drawings**

EM 8397907, Emerg. Diesel Gen #2 Elec Elementary Wiring Diagram, Sheet 2, Revision 31  
 EM 8397907, Emerg. Diesel Gen #2 Elec Elementary Wiring Diagram, Sheet 5, Revision 3  
 BR 3001, Emergency Power System One Line Diagram Emergency Diesel Generator, Sheet 2, Revision 4  
 GU 3E-822-21-1000, Standby Gas Treatment Flow Diagram, Sheet 1, Revision 11  
 GE 885D781, Core Spray System Flow Diagram, Sheet 1, Revision 76

**Maintenance Orders/Work Orders**

4695984	4695269	4696000	4697086	4694906	4698176
4700747	4603699	4696707	4697798	4352367	4376597
4351930	4391454	4691852	4352978	4376670	4370864
4361084	4361084	4361265	4345322		

**Section 1R22: Surveillance Testing****Procedures**

636.4.003, Diesel Generator #1 Load Test, Revision 109  
 607.4.015, Containment Spray and ESW System 2 Pump Operability, IST, and Containment Spray Pumps Trip, Revision 50  
 607.4.005, Containment Spray and Emergency Service Water Pump System 2 Operability and Comprehensive/Preservice/Post-Maintenance Inservice Test, Revision 83  
 604.3.001, Reactor Building to Torus Power Vacuum Breaker Test and Calibration, Revision 44  
 602.4.004, Main Steam Isolation Valve 10% Closure Test, Revision 31  
 RAP-J8b, Mn Stm Vlvs Off Normal, Revision 8

**Condition Reports**

4067838	4066532	4069291	4072512	4077912	4077910
4077914	4009234				

**Drawings**

GE 148F740, Containment Spray System Flow Diagram, Sheet 1, Revision 44  
 GU-3E-243-21-1000, Drywell & Torus Vacuum Relief System Flow Diagram, Sheet 1, Revision 29  
 BR 2002, Main Steam System Flow Diagram, Sheet 1, Revision 62  
 BR 2002, Main Steam System Flow Diagram, Sheet 2, Revision 72

Maintenance Orders/Work Orders

4688620	4684148	4390895	4377337	4678454	4638002
4684554					

**Section 1EP4: Emergency Action Level and Emergency Plan Changes**Procedures

EP-AA-1010, Addendum 3 Emergency Action Levels for Oyster Creek Station, Revision 2  
 EP-AA-1102, ERO Fundamentals, Revision 12

**Section 2RS2: Occupational As Low As Is Reasonably Achievable**Procedures

RP-AA-400-1004, Emergent Dose Control and Authorization, Revision 9  
 RP-AA-400-1006, Outage Exposure Estimating and Tracking, Revision 7  
 RP-AA-402, Radiation Protection Dose Excellence Planning Process, Revision 8  
 RP-AA-441, TEDE ALARA Evaluation, Revision 7

Audits, Self-Assessments, and Surveillances

NOSA-OYS-17-06 (AR4014246), Oyster Creek Generating Station – Radiation Protection  
 Audit Report (included ALARA and Respiratory Protection), dated August 2, 2017

Condition Reports

2718007	2720139	2725149	4037954	4053658	4056169
4058417	4060230				

Miscellaneous

Oyster Creek Generating Station Radiation Protection 01R26 Refueling Outage Report, dated  
 December 18, 2016  
 Oyster Creek Generating Station 2017 Abbreviated Exposure Reduction Plan, Revision 2017  
 Department Dose Actuals by Month vs Department Dose Goals, dated October 1, 2017  
 RP-AA-401 Attachment 4 ALARA Post Job Review, ALARA Plan 17-343, ORW Small Pump  
 Room De-sludge and Clear Sumps 1-10 and 1-11, dated November 6, 2017

**Section 2RS3: In-plant Airborne Radioactivity Control and Mitigation**Procedures

RP-AA-825, Maintenance Care and Inspection of Respiratory Protective Equipment, Revision 7  
 RP-AA-825-1014, Operation and Inspection of the 3M Versa Flo TR-300-PAPR System,  
 Revision 3  
 RP-AA-825-1035, Issue and Control of Respirators, Revision 2  
 RP-OC-826, Inspection of Firehawk Masks, Revision 8  
 RP-AA-440, Respiratory Protection Program, Revision 14  
 RP-AA-443, Quantitative Respirator Fit Testing, Revision 15  
 RP-OC-827, Flow Testing MSA Firehawk (MMR) SCBAs, Revision 4  
 RP-AA-444, Controlled Negative Pressure (CNP) Fit Testing, Revision 8  
 RP-AA-445, Quantitative Fit Testing Using Portacount Pro Model 8030, Revision 2

Audits, Self-Assessments, and Surveillances

NOSA-OYS-17-06 (AR4014246) Oyster Creek Generating Station – Radiation Protection Audit  
 Report (included ALARA and Respiratory Protection), dated August 2, 2017

Condition Reports

2724872	2735744	3957670	3963220	3969619	3970513
3998842	3999947	4026924	4071893		

Miscellaneous

RP-OC-826, Attachment 7 Emergency Equipment – SCBA – Check Off Sheet, November 2017  
 RP-OC-826, Attachment 3 Monthly SCBA Unit Inspection Log, November 1 – 5, 2017  
 RP-OC-827, Attachment 4 Maintenance and Repair Log May 8 to August 1, 2017  
 RP-AA-443 Attachment 8 Fit Test Checklist, EID 959958 MSA Ultra Elite Medium,  
 November 7, 2017  
 TRI Air Testing, Inc., Laboratory Report Compressed Air/Gas Quality Report for Oyster Creek  
 Fire Department Air Compressor, June 16, 2017  
 PRAXAIR, Certificate of Analysis, Grade E Air for Air Pack A1 BR, September 9, 2016  
 Sperian Posi3 S/N L04092 SCBA Test Results MSA Firehawk 4500 S/N MY160157,  
 November 6, 2017  
 N-MW-RP-RESP-2-MSA-FIREHAWK M7 Lesson Plan Respiratory Protection Equipment M7  
 SCBA, March 7, 2016  
 MSA Certificate of Accomplishment CARE Recertification for J. Buchta, August 22, 2017  
 MSA Certificate of Accomplishment CARE Recertification for E. Cummings, August 22, 2017  
 MSA Certificate of Accomplishment CARE Recertification for J. Fiumara, August 22, 2017  
 MSA Certificate of Accomplishment CARE Recertification for R. Hemmann, August 22, 2017  
 MSA Certificate of Accomplishment CARE Recertification for J. Wyjas, August 22, 2017  
 MSA Certificate Authorized CARE Service Facility, August 22, 2017  
 OC Respirator Fit Log - October 1 to November 7, 2017 Fit Test Report EID 952496,  
 MSA CARE Authorized Repair Center Certified CARE Technician Training  
 Honeywell Certificate of Calibration Posi3 Mask Fit Testing Unit S/N L04092, November 9, 2016  
 NISTLab/SAI Certificate of Calibration, TSI 8020 Mask Fit Testing Unit S/N 15965,  
 August 8, 2017

**Section 40A1: Performance Indicator Verification**Procedures

CY-OC-170-201, Compliance with Technical Specification 6.8.4 Radioactive Effluent Control  
 Program, Revision 2  
 ER-AA-600-1047, Mitigating Systems Performance Index Basis Document, Revision 11  
 LS-AA-2001, Collecting and Reporting of NRC Performance Indicator Data, Revision 14  
 LS-AA-2140, Monthly Data Elements for NRC Occupational Exposure Control Effectiveness,  
 Revision 5  
 LS-AA-2150, Monthly Data Elements for RETS/ODCM Radiological Effluent Occurrences,  
 Revision 5  
 LS-AA-2200, Mitigating System Performance Index Data Acquisition and Reporting, Revision 5  
 PI-AA-2003, Use of INPO Consolidated Data Entry Database for NRC, INPO and WANO  
 Data Entry, Revision 0  
 SP-AA-3000, Exelon Nuclear Performance Monitoring and Management Implementing Guide,  
 Revision 1

Audits, Self-Assessments, and Surveillances

NOS-OYS-15-06, Radiation Protection Audit Report, dated August 19, 2015

Condition Reports

3960189	4024497	4029931	4033552	4037912	4049561
---------	---------	---------	---------	---------	---------

Miscellaneous

Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7

MSPI Margin Monthly Reports – 4Q2016-3Q2017 Oyster Creek Unit 1 4Q2016-3Q2017

MSPI Data Oyster Creek Last Atmospheric Dose Summary: Noble Gas Air Dose

Summary January 1, 2017 to September 30, 2017, dated November 7, 2017

Audit Log - OC RETS/ODCM Occurrences for September 2017, dated October 3, 2017

CDE Unit Performance for OC Radiological Protection from January 2016 to September 2017, dated October 18, 2017

**Section 40A2: Problem Identification and Resolution**Procedures

351.1, The Chemical Waste/Floor Drain System Operating Procedure, Revisions 147 and 150

CC-AA-112, "Temporary Configuration Changes," Revision 26

LS-AA-104, "Exelon 50.59 Review Process," Revision 10

LS-AA-104-1000, "Exelon 50.59 Resource Manual," Revision 10

MA-AA-716-004, "Conduct of Troubleshooting," Revision 13

Work Orders

4187527      C2013518      C2036964

Condition Reports

1143292      2718867      2720787      2739051      3979455      4024693

4030143      4075210

Miscellaneous

NEI 96-07, "Guidelines for 10 CFR 50.59 Evaluations", Revision 1

New Radwaste Status Report, dated November 15, 2017

OC-2006-S-0301 for ECR 06-00740, 10 CFR 50.59 Screening, Revision 0

**LIST OF ACRONYMS**

ALARA	as low as is reasonably achievable
CFR	<i>Code of Federal Regulations</i>
EAL	emergency action level
LER	licensee event report
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
SCBA	self-contained breathing apparatus
UFSAR	Updated Final Safety Analysis Report