



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I  
2100 RENAISSANCE BLVD.  
KING OF PRUSSIA, PA 19406-2713**

October 31, 2016

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

**SUBJECT: OYSTER CREEK NUCLEAR GENERATING STATION – INTEGRATED INSPECTION  
REPORT 05000219/2016003**

Dear Mr. Hanson:

On September 30, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Oyster Creek Nuclear Generating Station. On October 13, 2016, the NRC inspectors discussed the results of this inspection with Mr. Garey Stathes, Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

The NRC inspectors did not identify any finding or violation of more than minor significance.

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 Public Document Room in accordance with 10 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 05000219/2016003  
w/Attachment: Supplementary Information

cc w/encl: Distribution via ListServ

Mr. Bryan Hanson  
 Senior Vice President, Exelon Generation Co., LLC  
 President and Chief Nuclear Officer, Exelon Nuclear  
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**U.S. NUCLEAR REGULATORY COMMISSION****REGION I**

Docket No. 50-219

License No. DPR-16

Report No. 05000219/2016003

Licensee: Exelon Nuclear

Facility: Oyster Creek Nuclear Generating Station

Location: Forked River, New Jersey

Dates: July 1, 2016 – September 30, 2016

Inspectors: A. Patel, Senior Resident Inspector  
E. Andrews, Resident Inspector  
B. Dionne, Health Physicist  
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S. Elkhiamy, Project Engineer  
T. Hedigan, Operations Engineer  
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C. Lally, Project Engineer  
M. Modes, Senior Reactor Inspector  
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J. Schoppy, Senior Reactor Inspector

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

Enclosure

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**SUMMARY**

Report 05000219/2016003; 07/01/2016 – 09/30/2016; Exelon Energy Company, LLC, Oyster Creek Generating Station.

This report covered a three-month period of inspection by resident inspectors and announced baseline inspections performed by regional inspectors. The Nuclear Regulatory Commission's (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. On July 1, 2016, operators lowered power to 85 percent for a rod pattern adjustment and returned the unit to 100 percent power the following day. On July 16, operators lowered power to 80 percent for rod pattern adjustment and returned the unit to 100 percent the following day. On July 30, operators lowered power to 85 percent for a rod pattern adjustment and returned the unit to 100 percent the following day. On August 31, operators lowered power to 92 percent for planned maintenance and returned the unit to 100 percent power on September 2. On September 7, operators lowered power to 92 percent for planned maintenance and returned the unit to 100 percent power on September 9. On September 18, operators commenced a plant shutdown, took the unit offline, and entered a refueling outage (1R26) on September 19. Oyster Creek remained shutdown and in a refueling outage (1R26) for the remainder of the inspection period.

### 1. REACTOR SAFETY

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

1R01 Adverse Weather Protection (71111.01 – 1 sample)

.1 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

The inspectors reviewed Exelon's response to a tropical storm warning issued by the National Weather Service on September 3, 2016. The inspectors reviewed the implementation of adverse weather preparation procedures before the onset of and during this adverse weather condition. The inspectors walked down the emergency diesel generators and emergency service water to ensure system availability. The inspectors verified that operator actions defined in Exelon's adverse weather procedure maintained the readiness of essential systems. The inspectors discussed readiness and staff availability for adverse weather response with operations and work control personnel. Documents reviewed for each section of this inspection report are listed in the Attachment.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04 – 5 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Containment spray system II while containment spray system I was out of service on July 5, 2016

- Service water systems I and II in preparation for hot weather alert on July 12, 2016
- 'A', 'B', and 'C' shutdown cooling pumps while in service for refueling outage (1R26) on September 20, 2016
- Core spray system I and II during refueling outage (1R26) on September 21, 2016
- Reactor building closed cooling water while cross-connected to emergency service water on September 29, 2016

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 updated final safety analysis report (UFSAR), technical specifications (TS), 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.

.2 Full System Walkdown (71111.04S – 1 sample)

a. Inspection Scope

From July 12-14, 2016, the inspectors performed a complete system walkdown of accessible portions of the No. 2 emergency diesel generator to verify the existing equipment lineup was correct. The inspectors reviewed operating procedures, surveillance tests, drawings, equipment line-up check-off lists, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, component lubrication and equipment cooling, hanger and support functionality, and operability of support systems. The inspectors performed field walkdowns of accessible portions of the systems to verify as-built system configuration matched plant documentation, and that system components and support equipment remained operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. Additionally, the inspectors reviewed a sample of related condition reports and work orders to ensure Exelon appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection.1 Resident Inspector Quarterly Walkdowns (71111.05Q – 6 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.

- Auxiliary boiler house on July 11, 2016
- Augmented off-gas building on July 11, 2016
- New auxiliary boiler house on July 26, 2016
- Old radwaste building and yard on July 26, 2016
- Chemistry lab on July 26, 2016
- Shutdown cooling room on September 20, 2016

b. Findings

No findings were identified.

.2 Fire Protection – Drill Observation (71111.05A – 1 sample)a. Inspection Scope

The inspectors observed a fire brigade drill scenario conducted on August 2, 2016, that involved a fire in the communications equipment room in the main office building. The inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that Exelon personnel identified deficiencies, openly discussed them in a self-critical manner at the debrief, and took appropriate corrective actions as required.

The inspectors evaluated the following specific attributes of the drill:

- Proper wearing of turnout gear and self-contained breathing apparatus
- Proper use and layout of fire hoses
- Employment of appropriate fire-fighting techniques
- Sufficient fire-fighting equipment brought to the scene
- Effectiveness of 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
- Drill objectives met



The inspectors also evaluated the fire brigade's actions to determine whether these actions were in accordance with Exelon's fire-fighting strategies.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)

.1 Internal Flooding Review

a. Inspection Scope

The inspectors reviewed the UFSAR, the site flooding analysis, and plant procedures to identify internal flooding susceptibilities for the site. The inspectors review focused on the upper cable spreading room area. It verified the adequacy of equipment seals located below the flood line, floor and water penetration seals, watertight door seals, common drain lines and sumps, sump pumps, level alarms, control circuits, and temporary or removable flood barriers. It assessed the adequacy of operator actions that Exelon had identified as necessary to cope with flooding in this area and also reviewed the corrective action program to determine if Exelon was identifying and correcting problems associated with both flood mitigation features and site procedures for responding to flooding.

b. Findings

No findings were identified.

1R08 In-service Inspection (71111.08G – 1 sample)

a. Inspection Scope

From September 26-28, 2016, during a refueling outage, the inspectors conducted an inspection and review of in-service inspection program activities to assess the effectiveness of Exelon's program for monitoring degradation of the reactor coolant system boundary, risk-significant piping system boundaries, and the containment boundary.

Non-destructive Examination and Welding Activities

The inspectors reviewed the non-destructive evaluation of risk-significant weld UT-16-002, C2035744-03 by record review. The inspectors verified the risk-significant weld was chosen, by Exelon staff, based on Electric Power Research Institute TR-112657 "Revised Risk-Informed In-service Inspection Evaluation Procedure," Revision B-A (ML 0134701020) with Code Case N-578-1, or Code Case N-716-1.

The inspectors verified that nondestructive evaluation activities were performed in accordance with 2007 Edition/2008 Addenda of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code requirements. The inspectors verified the nondestructive test met the requirements contained in ASME Section XI, Mandatory Appendix VIII, Article VIII-2000 and the examination personnel were qualified in accordance with ASME Section XI, Mandatory Appendix VII. The inspectors verified

that indications and defects, if present, were dispositioned in accordance with the ASME code and verified that relevant indications were compared to previous examinations to determine if any changes had occurred. The inspectors reviewed by record review containment Ultrasonic Thickness Gauging Report, 1R26-LRA-006, implemented in conformance with Exelon procedure for complying with the ASME Code 2007 Edition/2008 Addenda.

#### Welding on Pressure Boundary Systems

There was no welding on significant pressure boundary systems this refueling outage.

#### Identification and Resolution of Problems

The inspectors verified that the Exelon staff were identifying in-service inspection problems at an appropriate threshold and entering them in the corrective action program. The inspectors selected a sample of problems associated with in-service inspection documented by Exelon and verified the appropriateness of the corrective actions. The inspectors used the guidance in NRC inspection procedure 71152, "Identification and Resolution of Problems," to evaluate the corrective actions. The inspectors also determined if Exelon staff were assessing the applicability of operating experience.

#### b. Findings

No findings were identified.

### 1R11 Licensed Operator Regualification Program and Licensed Operator Performance

#### .1 Quarterly Review of Licensed Operator Regualification Testing and Training (71111.11Q – 1 sample)

#### a. Inspection Scope

The inspectors observed licensed operator simulator training on August 2, 2016, which included a trip of the 1A2 bus, a steam leak in the drywell, and an anticipated transient without 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 TS 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.

.2 Licensed Operator Requalification Program (71111.11A – 1 sample)a. Inspection Scope

On June 30, 2016, one NRC region-based inspector conducted an in-office review of results of licensee-administered annual operating tests for 2016 for Oyster Creek Nuclear Generating Station operators. The inspection assessed whether pass/fail rates were consistent with the guidance of NRC Manual Chapter 0609, Appendix I, and “Operator Requalification Human Performance Significance Determination Process”. The review verified that the failure rate (individual or crew) did not exceed 20 percent.

- None of the 53 operators failed any section of the annual examination. The overall individual failure rate was zero percent.
- None of the 10 crews failed the simulator test. The crew failure rate was zero percent.

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* (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.

- Containment spray system on July 20, 2016
- Commercial grade dedication on Capsuhelic differential pressure gauge for the No. 1 emergency diesel generator on July 26, 2016 (quality control)

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 4 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:

- Containment spray system I and emergency service water system I out of service for planned maintenance on July 5, 2016
- Hot weather alert on July 7, 2016
- Core spray system I out of service for planned testing on September 1, 2016
- Refueling outage yellow shutdown risk due to decay heat removal on September 18, 2016

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 7 samples)a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions based on the risk significance of the associated components and systems:

- Electromatic relief valve monitoring instrumentation on July 5, 2016
- Emergency service water pump 52A due to high vibrations on July 21, 2016
- Emergency service water pump 52D due to elevated upper bearing motor temperature on July 23, 2016
- Inadequate elevation of the core spray and containment spray pump suction strainers in the torus suction vortex calculation on August 15, 2016
- 'B' isolation condenser high conductivity in water sample on August 16, 2016
- No. 1 fire diesel oil sample results containing water on August 17, 2016
- Reactor building ventilation exhaust valve actuator failure on August 20, 2016

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 TS and UFSAR to Exelon evaluations to determine whether the components or systems were operable. The inspectors confirmed, where appropriate, compliance with bounding limitations associated with the evaluations. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled by Exelon.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 1 sample)

Temporary Modifications

a. Inspection Scope

The inspectors reviewed the temporary modifications listed below 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.

- Alternate letdown from shutdown cooling to reactor water cleanup on September 26, 2016

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 6 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.

- Emergency service water pump 52A following pump and motor replacement on July 24, 2016

- Reactor building system II ventilation after exhaust valve actuator replacement on August 22, 2016
- 'D' core spray pump after discharge check valve planned maintenance on September 26, 2016
- Control rod drive mechanism, 14-47, following replacement on September 27, 2016
- Core spray systems I and II following relay replacement on September 27, 2016
- Safety relief valve, V-1-168, following valve replacement on September 28, 2016

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 – 1 sample)

a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the Oyster Creek maintenance and refueling outage (1R26), which started on September 19, and ongoing at the end of the inspection period. The completion of this sample will be documented in the fourth quarter integrated inspection report.

The inspectors reviewed Exelon's development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. During the outage, the inspectors observed portions of the shutdown and cooldown processes and monitored controls associated with the following outage activities:

- Configuration management, including maintenance of defense-in-depth, commensurate with the outage plan for the key safety functions and compliance with the applicable technical specifications when taking equipment out of service
- Implementation of clearance activities and confirmation that tags were properly hung and that equipment was appropriately configured to safely support the associated work or testing
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication and instrument error accounting
- Status and configuration of electrical systems and switchyard activities to ensure that technical specifications were met
- Monitoring of decay heat removal operations
- Impact of outage work on the ability of the operators to operate the spent fuel pool cooling system
- Reactor water inventory controls, including flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss
- Activities that could affect reactivity
- Maintenance of secondary containment as required by technical specifications
- Refueling activities, including fuel handling and fuel receipt inspections
- Fatigue management
- Identification and resolution of problems related to refueling outage activities

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 5 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:

- Standby liquid control pump and valve operability and in-service test on July 5, 2016 (in-service test)
- Diesel driven fire pump No. 1 operability test on July 19, 2016
- Automatic scram contactor test on July 29, 2016
- Reactor building to torus vacuum breaker test on July 29, 2016
- Main steam isolation valve closure test on September 19, 2016 (isolation valve)

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness (EP)**1EP2 Alert and Notification System Evaluation (71114.02 - 1 sample)a. Inspection Scope

An onsite review was conducted to assess the performance, maintenance, and testing of the Oyster Creek's alert and notification system (ANS). During this inspection, the inspectors conducted a review of the ANS testing and maintenance programs. The inspectors reviewed the associated ANS procedures and the Federal Emergency Management Agency approved ANS Design Report to ensure compliance with design report commitments for system maintenance and testing. The inspection was conducted with 10 CFR 50.47(b)(5) and the related requirements of 10 CFR Part 50, Appendix E, as reference criteria.

b. Findings

No findings were identified.

1EP3 Emergency Response Organization Staffing and Augmentation System (71114.03 - 1 sample)a. Inspection Scope

The inspectors conducted a review of the Oyster Creek Emergency Response Organization (ERO) on-shift and augmentation staffing requirements and the process for notifying and augmenting the ERO. The review was performed to verify the readiness of

key Exelon staff to respond to an emergency event and to verify Exelon's ability to activate their emergency response facilities (ERF) in a timely manner. The inspectors reviewed the Oyster Creek's Emergency Plan for ERF activation and ERO staffing requirements, the ERO duty roster, applicable station procedures, augmentation test reports, the most recent drive-in drill reports, and corrective action reports related to this inspection area. The inspectors also reviewed a sample of ERO responder training records to verify training and qualifications were up to date. The inspection was conducted with Title 10 CFR 50.47(b) (2) and related requirements of 10 CFR Part 50, Appendix E, as reference criteria.

b. Findings

No findings were identified.

1EP5 Maintenance of Emergency Preparedness (71114.05 - 1 sample)

a. Inspection Scope

The inspectors reviewed a number of activities to evaluate the efficacy of Exelon's efforts to maintain the Oyster Creek emergency preparedness program. The inspectors reviewed: letters of agreement with offsite agencies; the 10 CFR 50.54(q) Emergency Plan change process and practice; Oyster Creek's maintenance of equipment important to EP; records of evacuation time estimate population evaluation; and provisions for, and implementation of, primary and backup ERF maintenance. The inspectors also verified Exelon's compliance at Oyster Creek with NRC EP regulations regarding: emergency action levels for hostile action events; protective actions for on-site personnel during events; emergency declaration timeliness; ERO augmentation and alternate facility capability; evacuation time estimate updates; and, on-shift ERO staffing analysis.

The inspectors further evaluated Exelon's ability to maintain their Oyster Creek EP program through their identification and correction of EP weaknesses, by reviewing a sample of drill reports, actual event reports, self-assessments, 10 CFR 50.54(t) reviews, and EP-related condition reports. The inspectors reviewed a sample of EP-related issue reports initiated at Oyster Creek from September 2014 through September 2016. The inspection was conducted with Title 10 CFR 50.47(b) and the related requirements of 10 CFR Part 50, Appendix E, as reference criteria.

b. Findings

No findings were identified.

**2. RADIATION SAFETY**

**Cornerstone: Occupational and Public Radiation Safety**

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01 - 7 samples)

a. Inspection Scope

The inspectors reviewed Exelon's performance in assessing and controlling radiological hazards in the workplace. The inspectors used the requirements contained in 10 CFR 20, TS, Regulatory Guide 8.38, and the procedures required by TS as criteria for determining compliance.



### Inspection Planning

The inspectors reviewed the performance indicators for the occupational exposure cornerstone, radiation protection program audits, and reports of operational occurrences in occupational radiation safety since the last inspection.

### Radiological Hazard Assessment

The inspectors conducted independent radiation measurements during walkdowns of the facility and reviewed the radiological survey program, air sampling and analysis, continuous air monitor use, recent plant radiation surveys for radiological work activities, and any changes to plant operations since the last inspection to verify survey adequacy of any new radiological hazards for onsite workers or members of the public.

### Instructions to Workers

The inspectors reviewed high radiation area work permit controls and use, observed containers of radioactive materials and assessed whether the containers were labeled and controlled in accordance with requirements. The inspectors reviewed several occurrences where a worker's electronic personal dosimeter alarmed. The inspectors reviewed Exelon's evaluation of the incidents, documentation in the corrective action program, and whether compensatory dose evaluations were conducted when appropriate. The inspectors verified follow-up investigations of actual radiological conditions for unexpected radiological hazards were performed.

### Contamination and Radioactive Material Control

The inspectors observed the monitoring of potentially contaminated material leaving the radiological controlled area and inspected the methods and radiation monitoring instrumentation used for control, survey, and release of that material. The inspectors selected several sealed sources from inventory records and assessed whether the sources were accounted for and were tested for loose surface contamination. The inspectors evaluated whether any recent transactions involving nationally tracked sources were reported in accordance with requirements.

### Radiological Hazards Control and Work Coverage

The inspectors evaluated in-plant radiological conditions and performed independent radiation measurements during facility walkdowns and observation of radiological work activities. The inspectors assessed whether posted surveys; radiation work permits; worker radiological briefings and radiation protection job coverage; the use of continuous air monitoring, air sampling and engineering controls; and dosimetry monitoring were consistent with the present conditions. The inspectors examined the control of highly activated or contaminated materials stored within the spent fuel pools and the posting and physical controls for selected high radiation areas, locked high radiation areas and very high radiation areas to verify conformance with the occupational performance indicator.

### Risk-Significant High Radiation Area and Very High Radiation Area Controls

The inspectors reviewed the procedures and controls for high radiation areas, very high radiation areas, and radiological transient areas in the plant.

### Radiation Worker Performance and Radiation Protection Technician Proficiency

The inspectors evaluated radiation worker performance with respect to radiation protection work requirements. The inspectors evaluated radiation protection technicians in performance of radiation surveys and in providing radiological job coverage.

### Problem Identification and Resolution

The inspectors evaluated whether problems associated with radiation monitoring and exposure control (including operating experience) were identified at an appropriate threshold and properly addressed in Exelon's corrective action program.

#### b. Findings

No findings were identified.

### 2RS2 Occupational As Low As Is Reasonably Achievable (ALARA) Planning and Controls (71124.02 - 3 samples)

#### a. Inspection Scope

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

### Inspection Planning

The inspectors conducted a review of Exelon's collective dose history and trends; ongoing and planned radiological work activities; previous post-outage ALARA reviews; radiological source term history and trends; and ALARA dose estimating and tracking procedures.

### Radiological Work Planning

The inspectors selected the following radiological work activities based on exposure significance for review:

- OCGS RWP 16-00211, NRW Fire Protection System Test in High Radiation Areas and Locked High Radiation Areas
- OCGS RWP 16-00350, RB 119' Refuel Floor Remove Equipment and Trash from Equipment Storage Pool
- OCGS RWP 16-901, 01R26 Reactor Disassembly, Refuel, Inspection and Reassembly
- OCGS RWP 16-506, 01R26 Drywell Scaffolding Activities
- OCGS RWP 16-513, 01R26 Under Vessel Preparation and Restoration Activities

For each of these activities, the inspectors reviewed: ALARA work activity evaluations, exposure estimates, exposure reduction requirements, results achieved (dose rate reductions, actual dose), person-hour estimates and results achieved and post-job reviews that were conducted to identify lessons learned.

### Verification of Dose Estimates and Exposure Tracking Systems

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 evaluated the adjustment of exposure estimates, or re-planning of work. The inspectors reviewed post-job ALARA evaluations of excessive exposure.

### Source Term Reduction and Control

The inspectors reviewed the current plant radiological source term and historical trend, plans for plant source term reduction, and contingency plans for changes in the source term as the result of changes in plant fuel performance or changes in plant primary chemistry. The inspectors observed radiological work activities and evaluated the use of shielding and other engineering work controls based on the radiological controls and ALARA plans for those activities.

### Radiation Worker Performance

The inspectors observed radiation worker and radiation protection technician performance during radiological work to evaluate worker ALARA performance according to specified work controls and procedures. Workers were interviewed to assess their knowledge and awareness of planned and/or implemented radiological and ALARA work controls.

### Problem Identification and Resolution

The inspectors evaluated whether problems associated with ALARA planning and controls were identified at an appropriate threshold and properly addressed in 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 Guide 8.15, Regulatory Guide 8.25, NUREG/CR-0041, TS, and procedures required by TS as criteria for determining compliance.

### Inspection Planning

The inspectors reviewed the UFSAR to identify ventilation and radiation monitoring systems associated with airborne radioactivity controls and respiratory protection equipment staged for emergency use. The inspectors also reviewed respiratory protection program procedures and current performance indicators for unintended internal exposure incidents.

### Engineering Controls

The inspectors reviewed operability and use of both permanent and temporary ventilation systems, and the adequacy of airborne radioactivity radiation monitoring in the plant based on location, sensitivity, and alarm set-points.

### Use of Respiratory Protection Devices

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, and individual qualification records.

### Problem Identification and Resolution

The inspectors evaluated whether problems associated with the control and mitigation of in-plant airborne radioactivity were identified at an appropriate threshold and addressed by Exelon's corrective action program.

#### b. Findings

No findings were identified.

#### 2RS4 Occupational Dose Assessment (71124.04 - 5 samples)

##### a. Inspection Scope

The inspectors reviewed the monitoring, assessment, and reporting of occupational dose. The inspectors used the requirements in 10 CFR 20, Regulatory Guides 8.9 and 8.34, TS, and procedures required by TS as criteria for determining compliance.

##### Inspection Planning

The inspectors reviewed radiation protection program audits, national voluntary laboratory accreditation program dosimetry testing reports and procedures associated with dosimetry operations.

##### Source Term Characterization

The inspectors reviewed the plant radiation characterization (including gamma, beta, alpha, and neutron) being monitored. The inspector verified the use of scaling factors to account for hard-to-detect radionuclides in internal dose assessments.

##### External Dosimetry

The inspectors reviewed dosimetry national voluntary laboratory accreditation program accreditation, onsite storage of dosimeters, the use of "correction factors" to align electronic personal dosimeter results with national voluntary laboratory accreditation program dosimetry results, dosimetry occurrence reports, and corrective action program documents for adverse trends related to external dosimetry.

### Internal Dosimetry

The inspectors reviewed internal dosimetry procedures, whole body counter measurement sensitivity and use, adequacy of the program for whole body count monitoring of plant radionuclides or other bioassay technique, adequacy of the program for dose assessments based on air sample monitoring and the use of respiratory protection, and internal dose assessments for any actual internal exposure.

### Special Dosimetric Situations

The inspectors reviewed Exelon's worker notification of the risks of radiation exposure to the embryo/fetus, the dosimetry monitoring program for declared pregnant workers, external dose monitoring of workers in large dose rate gradient environments, and any dose assessments performed since the last inspection that used multi-badging, skin dose or neutron dose assessments.

### Problem Identification and Resolution

The inspectors evaluated whether problems associated with occupational dose assessment were identified at an appropriate threshold and properly addressed in Exelon's corrective action program.

#### b. Findings

No findings were identified.

## **4. OTHER ACTIVITIES**

### 4OA1 Performance Indicator Verification (71151)

#### .1 Reactor Coolant System Specific Activity and Reactor Coolant System Leak Rate (2 samples)

##### a. Inspection Scope

The inspectors reviewed Exelon's submittal for the reactor coolant system specific activity and reactor coolant system leak rate performance indicators for the unit for the period of July 1, 2015, through June 30, 2016. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspectors also reviewed reactor coolant system sample analysis and control room logs of daily measurements of reactor coolant system leakage, and compared that information to the data reported by the performance indicator. Additionally, the inspectors observed surveillance activities that determined the reactor coolant system identified leakage rate, and chemistry personnel taking and analyzing a reactor coolant system sample.

##### b. Inspection Findings

No findings were identified.

.2 Drill and Exercise Performance, ERO Readiness, and ANS Reliability (3 samples)

a. Inspection Scope

The inspectors reviewed data for the following three EP Performance Indicators (PI): (1) drill and exercise performance; (2) ERO readiness; and, (3) ANS reliability. The last NRC EP inspection at Oyster Creek was conducted in the third calendar quarter of 2015. Therefore, the inspectors reviewed supporting documentation from EP drills and equipment tests from the third calendar quarter of 2015 through the third calendar quarter of 2016 to verify the accuracy of the reported PI data. The acceptance criteria documented in Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guidelines," Revision 7, was used as reference criteria.

b. Findings

No findings were identified.

.3 Occupational Exposure Control Effectiveness (1 sample)

a. Inspection Scope

The inspectors reviewed licensee submittals for the occupational radiological occurrences performance indicator for the third quarter 2015 through the second quarter of 2016. The inspectors used PI definitions and guidance contained in the Nuclear Energy Institute 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 walkdowns 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.

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

a. Inspection Scope

The inspectors reviewed licensee submittals for the radiological effluent technical specification and offsite does calculation manual radiological effluent occurrences performance indicator for the third quarter 2015 through the second quarter 2016. The inspectors used performance indicator definitions and guidance contained in the Nuclear Energy Institute Document 99-02, Revision 7, to determine if the 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 – 1 sample)

.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 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. 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 Part 21.

b. Findings

No findings were identified.

.2 Annual Sample: High Drywell Temperature

a. Inspection Scope

The inspectors performed an in-depth review of Exelon's commitments and corrective actions associated with Oyster Creek's need to reduce reactor power multiple times over the last three summers to avoid exceeding a design basis parameter for bulk drywell temperature. The maximum bulk drywell temperature analyzed prior to a design basis loss-of-coolant accident and main steam line break is 150 degrees Fahrenheit (°F).

The inspectors reviewed bulk drywell temperature algorithm calculations, plant process computer coding and processing of data health and controls when one or more of the 18 thermocouple inputs has degraded health. The inspector also assessed drywell cooling system configuration controls and corrective actions associated with RF-1-4 stuck open automatic damper, multiple dampers and inspection ports found out of position during March 2015 drywell entry. Additionally the inspector interviewed both engineering and operations personnel to assess their understanding of drywell cooling system design, operation and corrective actions. Deficiencies documented with the drywell cooling system, operating and training documents were reviewed. The inspector also reviewed thermocouple materials to design documents and walked down main control room drywell cooling system controls and operation.

b. Findings and Observations

No findings were identified.

Oyster Creek's corrective actions to avoid exceeding the bulk drywell temperature design basis limit of 150°F have been effective. The drywell cooling system is designed to limit bulk drywell temperature below 150°F during normal full power operation with four drywell cooling unit fans and reactor building closed cooling water supply to the drywell at 95°F or less. The drywell cooling system is not a safety related system and its inability to function optimally as designed has contributed to the number of reactor power reductions required to avoid the maximum bulk drywell temperature design limit.

The inspectors identified weaknesses in the quality and vulnerabilities of the algorithm calculation that derives the bulk drywell temperature indication used by the control room operators. Including:

- Identified weakness regarding operating the plant too close to a maximum design basis limit of 150°F bulk drywell temperature given the accuracy of the thermal couple instrumentation providing input to the algorithm calculation.
- Identified weakness in problem identification regarding the drywell bulk temperature primary plant computer point remaining in a "Questionable" health status for over ten years. The "Q", questionable designation is applied if one or more inputs to the temperature algorithm calculation is bad.
- Identified weakness in the primary plant computer bulk drywell temperature algorithm calculation which automatically enters a zero if all of a designated drywell zone's thermal couple inputs goes bad. This would result in a non-conservative (lower) displayed drywell bulk temperature because the algorithm data for that zone representing a volume of the primary containment would automatically be represented as 0°F. Historical data has been reviewed and was confirmed that there has never been a time were a zero was entered into the algorithm.

The above observations are related to a non-safety related drywell cooling system and had no adverse effects on cornerstone objectives or performance indicators. The observations are considered minor because Oyster Creek continues to operate the plant safely by preventing the bulk drywell temperature from reaching its design basis limit. Exelon entered these issues into their corrective action program as issue report 2710567.

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

(Closed) Exelon Licensee Event Report (LER) 052000219/2014-006-01:  
Reactor SCRAM due to Decreasing Reactor Water Level

On October 12, 2014, during a plant startup from a refueling outage (1R25), and reactor power ascension at approximately 1 percent of rated thermal power, reactor water level began to lower. An automatic reactor scram occurred moments before operators inserted a manual scram in accordance with station procedures. Following the reactor scram, all systems operated as expected. At the time of the event, Exelon personnel were performing a post-maintenance test on the automatic voltage regulator's human machine interface. Exelon personnel reset the automatic voltage regulator controllers, which triggered logic to trip the turbine.



The root cause of the event was determined that station leadership inconsistently reinforced human performance error reduction, tool use, and procedure use and adherence, which resulted in the breakdown of multiple fundamental practices and standards that led to the event. Exelon implemented actions to identify weaknesses in human performance error reduction, tool usage, and procedure use and adherence including reviewing station performance observations, generating and communicating a human performance vision statement to the site, and establishing first-line supervisor daily in-field observations.

This LER was revised to include information on the root cause report and subsequent corrective actions from the event. The inspectors reviewed this issue in NRC inspection report 05000219/2015002, Section 4OA3, 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.

#### 4OA5 Other Activities

##### .1 (Closed) Temporary Instruction 2515/190: Inspection of the Proposed Interim Actions Associated with Near-Term Task Force Recommendation 2.1 Flooding Hazard Evaluations

###### a. Inspection Scope

The inspectors performed activities to verify Exelon's conclusion that interim actions were required. The activities performed were based on questions provided by the NRC staff that reviewed Exelon's near-term task force recommendation 2.1 flood hazard re-evaluation submittal, as well as the inspector's assessment of the hazard posed to safety-related equipment by the predicted flood levels. The results of the inspection were provided to the associated NRC staff in separate correspondence.

The specific activities performed included:

1. The inspectors reviewed the Oyster Creek Nuclear Generating Station Flooding Hazard Re-Evaluation Report to identify the flooding mechanisms, pathways of concern, and consequences of the postulated worst case flooding events
2. The inspectors evaluated the impact of the postulated flooding on the safety-related equipment that would be potentially at risk
3. The inspectors inspected the exterior doors that would present the path for water infiltration to assess the material condition of the doors and the door seals
4. The inspectors inspected the proposed interim actions, materials, and procedures for Local Intense Precipitation and probable maximum flood events
5. The inspectors discussed the NRC staff reviewer's questions with Exelon engineering personnel to directly obtain their responses.

###### b. Findings

No findings were identified.

.2 Institute of Nuclear Power Operations (INPO) Report Review

a. Inspection Scope

The inspectors reviewed the final report for the INPO plant assessment of Oyster Creek conducted in February 2016. The inspectors evaluated the report to ensure that NRC perspectives of Exelon performance were consistent with any issues identified during the assessments. The inspectors also reviewed the report to determine whether INPO identified any significant safety issues that required further NRC follow-up.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On October 13, 2016, the inspectors presented the inspection results to Mr. Garey Stathes, 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

G. Stathes, Site Vice President  
 M. Gillin, Plant Manager  
 I. Abelev, System Engineer  
 M. Capone, System Engineer  
 M. Chanda, Oyster Creek Emergency Preparedness Manager  
 D. Chernesky, Director, Maintenance  
 J. Clark, Sr. Manager of Plant Engineering  
 R. Dutes, Regulatory Assurance Specialist  
 C. Hawkens, Level III Specialist  
 J. Jimenez, Senior Regulatory Assurance Specialist  
 T. Keenan, Manager, Site Security  
 W. Lopkoff, Operations Training Manager  
 M. McKenna, Manager, Regulatory Assurance  
 J. Renda, Director, Work Management  
 M. Rossi, Licensed Operator Requalification Training Lead  
 J. Stanley, Director, Engineering  
 C. Symonds, Director, Training  
 A. Syngal, IT Technical Analyst  
 E. Swain, Shift Operations Superintendent  
 H. Tritt, Electrical Design Engineering Manager  
 L. Velez, Programs Engineering Manger  
 J. Weissinger, Director, Operations  
 K. Wolf, Radiation Protection Manager

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

05000219/2014-006-01	LER	Reactor SCRAM due to Decreasing Reactor Water Level (Section 4OA3)
05000219/2515/190	TI	<u>Temporary Instruction 2515/190:</u> Inspection of the Proposed Interim Actions Associated with Near-Term Task Force Recommendation 2.1 Flooding Hazard Evaluations (Section 4OA5)

**LIST OF DOCUMENTS REVIEWED****Section 1R01: Adverse Weather Protection**Procedures

341, Emergency Diesel Generator Operation, Revision 112  
 ABN-31, High Winds, Revision 20  
 ABN-32, Abnormal Intake Level, Revision 27  
 ABN-36, Loss of Offsite Power & Station Blackout (Plant Control), Revision 29

OP-AA-108-111-1001, Severe Weather and Natural Disaster Guidelines, Revision 14  
OP-OC-108-109-1001, Severe Weather Preparation T&RM for Oyster Creek, Revision 33  
OP-OC-108-109-1004, Hurricane Staffing T&RM for Oyster Creek, Revision 5  
SY-AA-101-146, Severe Weather Preparation and Response, Revision 2

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

##### Procedures

310, Containment Spray System Operation, Revision 113  
341, Emergency Diesel Generator Operation, Revision 112  
322, Service Water System, Revision 90  
ABN-18, Service Water Failure Response, Revision 7  
305, Shutdown Cooling System Operation, Revision 123  
309.2, Reactor Building Closed Cooling Water System, Revision 95

##### Calculations

C-1302-531-E310-038, Spent Fuel Pool Cooling Evaluation in Support of Emergency Service  
Water to Service Water Cross Tie Modification, Revision 0

##### Condition Reports

2616439      2616633      2620854      2719450      2561508      2721510

##### Drawings

3E-862-21-1000, Emergency Diesel Generator Fuel Oil Storage and Transfer System Flow  
Diagram, Sheet 1, Revision 26  
3E-861-21-1000, Emergency Diesel Generator Air Cooling System, Sheet 1, Revision 13  
3E-861-21-1001, Emergency Diesel Generator Water Cooling System, Sheet 1, Revision 13  
3E-861-21-1002, Emergency Diesel Generator Lube Oil System, Sheet 1, Revision 15  
BR 2005, Reactor and Turbine Building Service Water System, Sheet 2, Revision 109  
BR 2005, Emergency Service Water System Flow Diagram, Sheet 4, Revision 88

##### Miscellaneous

Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report, Section 6.2,  
Containment Systems, Revision 18  
Oyster Creek Nuclear Generating Station Technical Specifications, Section 3.4,  
Emergency Cooling, Amendment 247

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

##### Procedures

OP-OC-201-008, Oyster Creek Pre-Fire Plans, Revision 22  
OP-OC-201-012-1001, On-Line Fire Risk Management, Revision 4  
OP-AA-201-012-1001, Operations On-Line Fire Risk Management, Revision 1  
OP-OC-201-008-1039, Auxiliary Boiler House, Revision 1  
OP-OC-201-008-1048, Augmented Offgas Building, AOG, Revision 1  
OP-OC-201-008-1047, Boiler house #1 & Boiler house #2, Revision 1  
OP-OC-201-008-1017, Chem Lab Area, Revision 1  
OP-OC-201-008-9999, Old Rad Waste Building, Revision 0  
OP-OC-201-008-1013, Main Office Building, Revision 1  
OP-OC-201-008-1006, Reactor Building (38' Elevation) Shutdown Cooling Room, Revision 0  
WC-AA-101-1006, On-Line Risk Management and Assessment, Revision 2  
ER-AA-600-1069, High Risk Fire Area Identification, Revision 1

FSP-AB13, Fire Support Procedure for Aux Boiler House, Revision 3  
FSP-OG21, Fire Support Procedure for AOG Building, Revision 3  
FSP-OR33, Fire Support Procedure for Old/New Radwaste Yard Area, Revision 3  
ABN-3, Loss of Shutdown Cooling, Revision 5

Condition Reports

2699621  
2699914

Miscellaneous

Fire Drill Record, dated August 2, 2016

**Section 1R06: Flood Protection Measures**

Procedures

ABN 20, TBCCW Failure Response, Revision 11  
ABN 29, Plant Fires, Revision 30  
ABN 30, Control Room Evacuation, Revision 27  
101.2, Oyster Creek Site Fire Protection Program, Revision 73  
309.1, Turbine Building Closed Cooling Water, Revision 57  
645.4.004, Fire Suppression Water System Valve Lineup, Revision 5  
OP-OC-201-008-1019, New Cable Spreading Room, Revision 1

Miscellaneous

OC-PSA-012, Internal Flood Evaluation Summary Notebook, Revision 1

**Section 1R08: In-Service Inspection**

Procedure

TR-112657, Revised Risk-Informed Inservice Inspection Evaluation Procedure, Revision B-A  
ER-AA-335-004, Ultrasonic Measurement of Material Thickness and Interfering Conditions,  
Revision 7

Miscellaneous

A5311CAP    A5329CAP    A5351CAP    A5322CAP    A5352CAP    A5322CAP

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

Procedures

HU-AA-101, Human Performance Tools and Verification Practices, Revision 9  
TQ-AA-150, Operator Training Programs, Revision 11  
TQ-AA-155, Conduct of Simulator Training and Evaluation, Revision 5

**Section 1R12: Maintenance Effectiveness**

Procedures

ER-AA-310, Implementation of the Maintenance Rule, Revision 9  
ER-AA-310-1001, Maintenance Rule – Scoping, Revision 4  
ER-AA-310-1004, Maintenance Rule – Performance Monitoring, Revision 13 310,  
Containment Spray System, Revision 113  
SM-AA-300, Procurement Engineering Support Activities, Revision 6  
SM-AA-300-1001, Procurement Engineering Process and Responsibilities, Revision 18

NO-AA-10, Quality Assurance Topical Report, Revision 90  
NO-AA-300-1001, Nuclear Oversight Independent Inspection Plan, Revision 9  
CC-AA-320-1002, Dynamic (Seismic) Qualification for Alternate Replacement Items and  
Commercial Grade Dedication Items, Revision 3

Condition Reports

2623460  
2387843  
2505923  
677651  
392475

Miscellaneous

Oyster Creek Maintenance Rule Database, dated July 12, 2016  
Oyster Creek Containment Spray System Health Reports, 2Q2016  
Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report, Section 6.2,  
Containment Systems, Revision 16  
Purchase Order 80-069845, dated February 24, 2016  
Fleet PE Commercial Grade Dedication (CGD) Process – Self-Assessment, dated  
June 30, 2015  
ECR 16-00041, EDG-1 Performance Monitoring Enhancements, Revision 0

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

Procedures

WC-AA-101, Online Work Control Process, Revision 26  
WC-AA-101-1002, Online Scheduling Process, Revision 17  
WC-AA-104, Integrated Risk Management, Revision 23  
OP-AA-108-117, Protected Equipment Program, Revision 4  
OP-MA-109-101, Clearance and Tagging, Revision 20  
WC-OC-101-1001, Online Risk Management and Assessment, Revision 19  
ABN 60, Grid Emergency, Revision 18  
610.4.003, Core Spray Valve Operability and In-Service Test, Revision 44  
610.4.021, Core Spray System 1 Pump Operability and Quarterly In-Service Test, Revision 30

Condition Reports

2689826      2689827      2689830      2689811      2689787

Drawings

P6-50-00, Oyster Creek 230 KV Substation, Sheet 1, Revision 14

Miscellaneous

Oyster Creek Nuclear Generating Station Technical Specifications, Section 3.7,  
Auxiliary Electrical Power, Amendment 256  
Oyster Creek Nuclear Generating Station Technical Specifications, Section 3.4,  
Emergency Cooling, Amendment 247

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

Procedures

310, Containment Spray System Operation, Revision 113  
2400-SMM-3531.01, ESW Pump and Motor Maintenance, Revision 14 101.2, Oyster Creek Site  
Fire Protection Program

MA-AA-716-230-1001, Oil Analysis Interpretation Guideline, Revision 19  
 RAP-J8a, Trunnion Rm Temp Hi, Revision 6  
 EMG-3200.11, Secondary Containment Control, Revision 13  
 329, Reactor Building Heating, Cooling and Ventilation System, Revision 63  
 330, Standby Gas Treatment System, Revision 57  
 307, Isolation Condenser System, Revision 125  
 CY-OC-120-520, Isolation Condenser Sampling, Revision 8  
 CY-OC-120-1102, Auxiliary Plant System Sample and Analysis Schedule, Revision 9  
 CY-OC-120-110, Chemistry Limits and Frequencies, Revision 3  
 OP-AA-108-105-1001, MCR Equipment Deficiency Management Screening, Revision 5  
 EMG-SP4, Operation of the Core Spray System, Revision 2  
 2000-BAS-3200.02, EOP Users Guide, Revision 8

#### Condition Reports

2696098	2695926	0952501	2695253	2695591	2689607
2705488	2702761	2706517	2706523	2706626	2706787
2706707	2706673	1364257	2703177	2704689	2449600
2538602	1691267	1663612	1673853	1684455	2408955
2693281	2696056	2699883			

#### Calculations

C-1302-532-E540-035, ESW System Design Basis, Revision 3  
 C-1302-212-5450-027, Emergency Operating Procedure Vortex Limit for Core Spray and Containment Spray Pumps, Revisions 2 and 3

#### Drawings

BR 2011, Reactor Building Ventilation Flow Diagram, Sheet 2, Revision 64  
 GU 3E-243-21-1000, Drywell and Torus Vacuum Relief System Flow Diagram, Sheet 1, Revision 29

#### Miscellaneous

Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report, Section 5.2, Integrity of Reactor Coolant Pressure Boundary, Revision 17  
 Oyster Creek Nuclear Generating Station Technical Specifications, Section 3.13, Accident Monitoring Instrumentation, Amendment 214  
 Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report, Section 6.2, Containment Systems, Revision 18  
 Oyster Creek Nuclear Generating Station Technical Specifications, Section 3.4, Emergency Cooling, Amendment 247  
 Oyster Creek Nuclear Generating Station Technical Specifications, Section 3.8, Isolation Condenser, Amendment 241  
 Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report, Section 6.5, Fission Product Removal and Control Systems, Revision 17  
 Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report, Section 9.4, Heating, Ventilation, and Air Conditioning Systems, Revision 14  
 Technical Evaluation 1364257-08, Affect of Calcium Bicarbonate in the Isolation Condenser, dated April 2013

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

#### Procedures

305, Shutdown Cooling System Operation, Revision 123  
 OP-OC-117-101-1001, Operations with Potential to Drain Reactor Vessel, Revision 2

Condition Reports

2026152      2364496      2411349

Drawings

GE 148F711, Reactor Shutdown Cooling System Flow Diagram, Sheet 1, Revision 43

Maintenance Orders/Work Orders

R2118019      R2246185

Miscellaneous

Safety Evaluation 000215-027, Alternate Letdown from Shutdown Cooling to Reactor Water Cleanup, Revision 0

Oyster Creek Nuclear Generating Station Technical Specifications, Section 3.5, Containment, Amendment 196

Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report, Section 5.4 Component and Subsystem Design, Revision 18

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

310, Containment Spray System Operation, Revision 113

607.4.004, Containment Spray and Emergency Service Water Pump System 1 Operability and Comprehensive/Preservice/Post-Maintenance Inservice Test, Revision 98

651.4.001, Standby Gas Treatment System Auto Actuation Test, Revision 72

302.1, Control Rod Drive System Operation, Revision 116

308, Emergency Core Cooling System Operation, Revision 96

Calculations

C-1302-532-E540-036, ESW System Design Basis, Revision 3

Condition Reports2706756      2706725      2706568      2188265      2369913      2339401  
2339402      2377024      2714883      2718430      2722356Drawings

GE 885D781, Core Spray System Flow Diagram, Sheet 1, Revision 71

GE 237E487, Control Rod Drive System Flow Diagram, Sheet 1, Revision 65

Maintenance Orders/Work Orders

R2131578      R2180812      R2118019      R2250154

Miscellaneous

Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report, Section 6.2, Containment Systems, Revision 18

Oyster Creek Nuclear Generating Station Technical Specifications, Section 3.4, Emergency Cooling, Amendment 247

Oyster Creek Nuclear Generating Station Technical Specifications, Section 3.2, Reactivity Control, Amendment 178

Oyster Cooling, Amendment 247

Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report, Section 3.9, Mechanical Systems and Components, Revision 17



**Section 1R20: Refueling and Other Outage Activities**

Procedures

203, Plant Shutdown, Revision 88  
205.0, Reactor Refueling, Revision 80  
205.62, Refueling Bridge Check-Off, Revision 43  
360, Refuel Bridge Operation, Revision 24

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619.4.025, Automatic Scram Contactor Test, Revision 14  
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**Section 2RS1: Access Control to Radiologically Significant Areas**Procedures

RP-AA-800, Control, Inventory and Leak Testing of Radioactive Sources, Revision 7  
RP-AA-500-1003, 10CFR Part 37 Material Accountability Program, Revision 1  
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RP-AA-503, Unconditional Release Survey Method, Revision 14  
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RP-AA-800-001, Nationally Tracked Source Program, Revision 2

RP-AA-503-F-01, Unconditional Release Instructions Using the Small Article Monitor (SAM),  
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RP-AA-300-10001, Discrete Radioactive Particle Controls, Revision 5

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A Evaporator, August 29, 2015

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Aisle, August 29, 2016

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**Section 2RS2: Occupational As Low As Reasonably Achievable Planning and Control**

Procedures

RP-OC-6006, Reactor Cavity and Equipment Pit Leak Mitigation and Decontamination, Revision 4  
 RP-AA-400-1006, Outage Exposure Estimating and Tracking, Revision 5  
 RP-AA-400-1004, Emergent Dose Control and Authorization, Revision 8  
 RP-AA-400-1009, Remote Monitoring System, Revision 2  
 RP-AA-401, Operational ALARA Planning and Controls, Revision 21

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 RP-AA-401 Attachment 2 Combined ALARA Plan/ Micro ALARA Plan 16-506 Scaffold Activities, June 8, 2016  
 RP-AA-400 Attachment 3 SAC Agenda, June 23, 2016  
 RP-AA-400 Attachment 3 SAC Agenda, May 25, 2016  
 RP-AA-400 Attachment 3 SAC Agenda, July 21, 2016  
 RP-AA-401 Attachment 4 ALARA Post –Job Review: Replace D Recirc Pump Seal, May 16, 2016  
 RP-AA-401 Attachment 4 ALARA Post –Job Review: DW Ni System, May 18, 2016  
 RP-AA-401 Attachment 4 ALARA Post –Job Review: Control Rod Drive (CRD) Exchange Activities, July 26, 2016  
 RP-AA-401 Attachment 4 ALARA Post –Job Review: Recirc Pump Seal and Motor Activities, May 4, 2016  
 RP-AA-441 Attachment 2 TEDE ALARA Evaluation Screening Worksheet, Main Steam Safety Relief Valve Activities, June 29, 2016  
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RP-AA-700-1300, Calibration, Operation and Source Check of the Eberline Beta Air Monitor AMS-3, Revision 3  
 RP-AA-440, Respiratory Protection Program, Revision 13  
 RP-AA-870-1001 Setup and Operation of Portable Air Filtration Equipment, Revision 6  
 RP-AA-445, Quantitative Fit Testing using Portacount Pro Model 8030, Revision 0  
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 RP-AA-870-1004, Use of Air Movers Portable Fans In Radiologically Controlled Areas, Revision 1  
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 RP-AA-825-1012, Inspection and Use of the Mururoa Blu Ethyfuge PAPR Suit, Revision 4  
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RP-AA-210, Dosimetry Issue, Usage and Control, Revision 26  
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RP-AA-203-1001 Attachment 1 Personnel Exposure Investigation, Employee ID 022564, December 1, 2015

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RP-AA-270 Attachment 2 Declaration of Intent to become Pregnant, Employee ID 033163, August 24, 2016

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OC-16-005 Radiation Protection Calculation and Position Paper: WBC Calibration Report for 2016, September 2, 2016

RP-AA-203 Attachment 1 Dose Control Level Extension Form for CRD Worker #1, September 12, 2016

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ER-AB-331-1006, BWR Reactor Coolant System Leakage Monitoring and Action Plan, Revision 2

LS-AA-2110, Monthly Data Elements for NRC Emergency Response Organization (ERO) Drill Participation, Revision 007

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Procedures

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OC-PPC-SRS-001, System Requirements Specification for the Oyster Creek Safety Parameter Display System (SPDS), Revision 3  
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312.9, Primary Containment Control, Revision 62  
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NRC Docket No. 50-219 LS-85-11-031 Memorandum to VP & Director Oyster Creek NGS, dated November 11, 1985  
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**Section 40A3: Follow-up of Events and Notices of Enforcement Discretion**

Procedures

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HU-AA-101, Human Performance Tools and Verification Practices, Revision 9  
HU-AA-104-101, Procedure Use and Adherence, Revision 5  
MA-AA-716-010, Maintenance Planning, Revision 23

**Section 4OA5: Other Activities**

Miscellaneous

Oyster Creek Nuclear Generating Station February 2016 Evaluation Final Report

**LIST OF ACRONYMS**

ADAMS	Agencywide Documents Access and Management System
ALARA	as low as reasonably achievable
ANS	alert and notification system
ASME	American Society of Mechanical Engineers
CFR	<i>Code of Federal Regulations</i>
EP	emergency preparedness
ERF	emergency response facilities
ERO	emergency response organization
INPO	Institute of Nuclear Power Operations
LER	licensee event report
NRC	Nuclear Regulatory Commission
PI	performance indicator
TS	technical specifications
UFSAR	Updated Final Safety Analysis Report
°F	degrees Fahrenheit