



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

August 3, 2017

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

**SUBJECT: OYSTER CREEK NUCLEAR GENERATING STATION – INTEGRATED
INSPECTION REPORT 05000219/2017002**

Dear Mr. Hanson:

On June 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Oyster Creek Nuclear Generating Station. On July 12, 2017, 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.

NRC inspectors documented one finding of very low safety significance (Green) in this report. The finding did not involve a violation of NRC requirements.

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U. S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I, and the NRC Resident Inspector at Oyster Creek Nuclear Generating Station.

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

B. Hanson

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Enclosure:

Inspection Report 05000219/2017002

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INSPECTION REPORT 05000219/2017002 DATED AUGUST 3, 2017

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No. 50-219

License No. DPR-16

Report No. 05000219/2017002

Licensee: Exelon Nuclear

Facility: Oyster Creek Nuclear Generating Station

Location: Forked River, New Jersey

Dates: April 1, 2017 – June 30, 2017

Inspectors: A. Patel, Senior Resident Inspector
E. Andrews, Resident Inspector
H. Anagnostopoulos, Senior Health Physicist
B. Dionne, Health Physicist
T. Hedigan, Operations Engineer
R. Rolph, Health Physicist
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Approved By: Silas R. Kennedy, Chief
Reactor Projects Branch 6
Division of Reactor Projects

Enclosure

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SUMMARY

Inspection Report 05000219/2017002; 04/01/2017 – 06/30/2017; Oyster Creek Nuclear Generating Station; Operability Determinations and Functionality Assessments.

This report covered a three-month period of inspection by resident inspectors and announced baseline inspections performed by regional inspectors. The inspectors identified one finding, which was of very low safety significance (Green). The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated October 28, 2016. Cross-cutting aspects are determined using IMC 0310, "Aspects within the Cross-Cutting Areas," dated December 4, 2014. All violations of Nuclear Regulatory Commission (NRC) requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding associated with Exelon procedure OP-AA-108-115, "Operability Determinations," because Exelon did not adequately assess the No. 2 emergency diesel generator operability with a degraded fuel oil filter. Specifically, Exelon did not adequately assess the capability of the emergency diesel generator to perform its function during its credited duration time of 72 hours. Exelon entered this issue into the corrective action program for resolution as issue report (IR) 3999576 and IR 3990799 and subsequently replaced the fuel oil filter.

The finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems cornerstone objective to ensure the reliability and capability of systems that respond to initiating events to prevent undesirable consequences. This issue was also similar to Example 3j of IMC 0612, Appendix E, "Examples of Minor Issues," because the condition resulted in reasonable doubt of the operability of the No. 2 emergency diesel generator and additional analysis was necessary to verify operability. The inspectors evaluated the finding using Exhibit 2, "Mitigating System Screening Questions," in Appendix A to IMC 0609, "Significance Determination Process." The inspectors determined that this finding was a deficiency affecting the design or qualification of a mitigating structure, system, or component (SSC), where the SSC maintained its operability or functionality. Therefore, inspectors determined the finding to be of very low safety significance (Green). The finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Evaluation, because Exelon did not thoroughly evaluate the issue associated with the degraded fuel oil filter and its impact to the No. 2 emergency diesel generator operability [P.2]. (Section 1R15)

REPORT DETAILS

Summary of Plant Status

Oyster Creek began the inspection period at 100 percent power. On April 9, 2017, operators lowered power to 80 percent for a rod pattern adjustment and returned the unit to 100 percent power the following day. Oyster Creek remained at or around 100 percent power for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 2 samples)

1. Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

The inspectors reviewed Exelon's readiness for the onset of seasonal high temperatures. The review focused on the 'B' battery ventilation system 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 hot weather conditions. Documents reviewed for each section of this inspection report are listed in the Attachment.

b. Findings

No findings were identified.

.2 Summer Readiness of Offsite and Alternate Alternating Current (AC) Power Systems

a. Inspection Scope

The inspectors reviewed plant features and procedures for the operation and continued availability of the offsite and alternate AC power system to evaluate readiness of the systems prior to seasonal high grid loading. The inspectors reviewed Exelon procedures affecting these areas and the communications protocols between the transmission system operator and Exelon. This review focused on changes to the established program and material condition of the offsite and alternate AC power equipment.

The inspectors assessed whether Exelon established and implemented appropriate procedures and protocols to monitor and maintain availability and reliability of both the offsite AC power system and the onsite alternate AC power system. The inspectors evaluated the material condition of the associated equipment by interviewing the responsible system manager, reviewing condition reports and open work orders, and walking down portions of the offsite and AC power systems.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04 – 3 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Emergency diesel generators on April 25, 2017
- Core spray system II on May 23, 2017
- 'B' isolation condenser when the 'A' isolation condenser was out of service on June 27, 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, issue 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

.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.

- Turbine building mezzanine 23' elevation on May 1, 2017
- Turbine building basement floor on May 1, 2017
- Feedwater pump room on May 1, 2017
- Reactor building equipment drain tank room on June 6, 2017
- Turbine operating floor on June 15, 2017
- Turbine lube oil storage on June 15, 2017

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 May 24, 2017, that involved a fire in the environmental lobby lab. 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 fire-fighting strategies.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)

.1 Annual Review of Cables Located in Underground Bunkers/Manholes

a. Inspection Scope

The inspectors conducted an inspection of underground bunkers/manholes subject to flooding that contain cables whose failure could affect risk-significant equipment. The inspectors performed walkdowns of risk-significant areas, including two manholes, MH-743-3 and MH-731-1, to verify that the cables were not submerged in water, that cables and/or splices appeared intact, and to observe the condition of cable support structures. When applicable, the inspectors verified proper sump pump operation and verified level alarm circuits were set in accordance with station procedures and calculations to ensure that the cables will not be submerged. The inspectors also ensured that drainage was provided and functioning properly in areas where dewatering devices were not installed.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program and Licensed Operator Performance (71111.11Q – 2 samples)

.1 Quarterly Review of Licensed Operator Regualification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training on May 2, 2017, which included a failure of a recirculation pump with an anticipated transient without a scram and the failure of select components to automatically start as required. 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. 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 Quarterly Review of Licensed Operator Performance in the Main Control Room

a. Inspection Scope

The inspectors observed control room operator performance during the core spray system I instrument channel calibration and test on June 1, 2017. The inspectors observed infrequently performed test or evolution briefings, shift turnover briefings, and alarm response.

Additionally, the inspectors observed test performance to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards.

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 SSC 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 SSC 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 SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs 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.

- Commercial grade dedication on Thermometrics H040-00000003 Thermistor for the standby liquid control liquid poison tank temperature controller on April 10, 2017 (quality control)
- Isolation condenser system on June 22, 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.

- 'B' isolation condenser out of service for planned maintenance on April 12, 2017
- Emergency service water system I out of service for planned maintenance on April 17, 2017
- No. 1 emergency diesel generator out of service for planned maintenance on May 15, 2017
- Core spray system I out of service for planned maintenance on June 1, 2017
- No. 2 emergency diesel generator out of service for planned maintenance on June 19, 2017

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 6 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:

- Emergency diesel generator No. 2 with a degraded fuel oil filter on April 1, 2017
- Standby liquid control low temperature on April 4, 2017
- Degraded secondary containment integrity on May 8, 2017
- Emergency diesel generator No. 1 automatic voltage regulator fuse discrepancy on May 17, 2017
- 'C' battery with gap between the battery cells and the railing on May 31, 2017
- Core spray system degraded net positive suction head during flow transition on June 2, 2017

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. 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

Introduction. The inspectors identified a Green finding associated with Exelon procedure OP-AA-108-115, "Operability Determinations," because Exelon did not adequately assess the No. 2 emergency diesel generator operability with a degraded fuel oil filter. Specifically, Exelon did not adequately assess the capability of the emergency diesel generator to perform its function during its credited duration time of 72 hours.

Description. Oyster Creek's emergency power distribution system design contains two emergency diesel generators, No. 1 and No. 2, which serve as standby AC power sources for the two safety-related 4160 volts alternating current vital buses in the event of a loss of normal offsite power.

During emergency diesel generator operation, the fuel from the fuel oil pump flows through a dual-element filter into the fuel injectors. Normal fuel oil pressure, sensed upstream of the filter is approximately 34 psig. A relief valve upstream of the filter, set at approximately 60 psig, would allow the fuel to flow through the relief valve into the day tank, thus bypassing the fuel injectors and subsequently starve the emergency diesel generator of fuel. Technical Specification bases 3.7, states in part, "if makeup fuel to the diesel fuel oil tank is not available, the loading on the emergency diesel generators can be managed so that they can provide their design basis function without makeup to the fuel oil tank for three days (72 hours)."

The inspectors reviewed IR 3986258 that documented an adverse trend in fuel oil pressure due to the degraded fuel oil filter during emergency diesel generator testing. Emergency diesel generator testing data showed a fuel oil pressure at 44 psig and trending up since November 2016. At the current rate, 60 psig could have been reached at 59 hours of continuous run time, and at this point emergency diesel generator would not be able to perform its function. IR 3986258 documented an operability determination of the impact of the degraded fuel oil filter to the emergency diesel generator operability in accordance with Exelon procedures, OP-AA-108-115, "Operability Determinations," and OP-AA-108-115-1002, "Supplemental Consideration for On-Shift Immediate Operability Determinations." OP-AA-108-115, states in part, "in order to be considered operable, an SSC must be capable of performing the safety functions specified by its design, within the required range of design physical conditions, initiation times, and mission times. For operability determination purposes, the mission time is the duration of structure, system and component (SSC) operation that is credited in the design basis for the SSC to perform its specified safety function." Also, Exelon procedure OP-AA-108-115-1002, states in part, "the ability of a SSC to fulfill its mission time/duty cycle are thoroughly assessed."

The inspectors identified that Exelon did not adequately assess the emergency diesel generator capability to perform its function during its 72 hour credited duration time. The inspectors noted that the initial operability determination for the IR evaluated the degraded fuel oil filter and its impact to the emergency diesel generator operation for a 6 hour duration time. The inspectors questioned the evaluation of 6 hours because that was based on the Mitigating System performance indicator which is a risk based evaluation and not an operability based evaluation. Subsequent to the discussions between the inspectors and Exelon operations, the engineering department determined the emergency diesel generator was operable for a 24 hour duration time. The inspectors further questioned Exelon because of the technical specification bases statement and the lack of documentation for the basis of the 24 hour duration time. Upon further review, Exelon determined they did not have a current licensing basis to support 24 hours as a credited duration time and that the current licensing basis for operability should be based on 72 hours.

The inspectors, as stated above, noted the fuel oil pressure trend could reach 60 psig at approximately 59 hours of continuous running of the emergency diesel generator. Based on the degraded condition and the credited duration time of 72 hours, the inspectors questioned the overall operability of the emergency diesel generator to perform its safety function for the full 72 hours. Exelon promptly placed the inspectors concern into the corrective action program (IR 3999576 and IR 3990799) and changed the degraded fuel oil filter.

Exelon also completed an analysis of the as-found degraded duplex fuel filter and determined, through an analysis at Exelon's Powerlab, that the filter could have reached the 60 psig relief valve setting at 72.9 hours and therefore the emergency diesel generator would still be capable of performing its intended function for the full 72 hours.

Analysis. The inspectors determined that inadequate assessment of the degraded fuel oil filter's impact to the No. 2 emergency diesel generator operability duration time in accordance with OP-AA-108-115 was a performance deficiency that was within Exelon's ability to foresee and correct. The performance deficiency was more than minor because it is associated with the equipment performance attribute of the Mitigating Systems cornerstone objective to ensure the reliability and capability of systems that respond to initiating events to prevent undesirable consequences. This issue was also similar to Example 3j of IMC 0612, Appendix E, "Examples of Minor Issues," because the condition resulted in reasonable doubt of the operability of the No. 2 emergency diesel generator and additional analysis was necessary to verify operability. Specifically, the degraded fuel oil filter condition could have degraded further during the emergency diesel generator run and after approximately 59 hours of the required 72 hours reach 60 psig. A relief valve upstream of the filter opens at 60 psig allowing the fuel to bypass the fuel injectors and as a result the emergency diesel generator would not be able to perform its intended function.

The inspectors evaluated the finding using Exhibit 2, "Mitigating System Screening Questions," in Appendix A to IMC 0609, "Significance Determination Process." The inspectors determined that this finding was a deficiency affecting the design or qualification of a mitigating SSC, where the SSC maintained its operability or functionality. Therefore, inspectors determined the finding to be of very low safety significance (Green). The finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Evaluation, because Exelon did not thoroughly evaluate the issue associated with the degraded fuel oil filter and its impact to the No. 2 emergency diesel generator operability [P.2].

Enforcement. This finding does not involve enforcement action because no regulatory requirement violation was identified. Exelon entered this issue into their corrective action program as IR 3999576. Because this finding does not involve a violation and has very low safety significance, it is identified as a Finding. **(FIN 05000219/2017002-01, Inadequate Assessment of Degraded Fuel Oil Filter Impact to Emergency Diesel Generator Operability).**

1R18 Plant Modifications (71111.18 – 2 samples)

.1 Permanent Modifications

a. Inspection Scope

The inspectors evaluated a modification to the standby liquid control liquid poison tank temperature controller implemented using engineering change package PEEVAL 100916. The inspectors also evaluated a modification to the unidentified leak rate calculation implemented using engineering change package OC-2017-S-0032. The inspectors verified that the design bases, licensing bases, and performance capability of the affected systems were not degraded by the modification. In addition, the inspectors reviewed modification documents associated with the upgrade and design change, including replacement of the temperature controller.

The inspectors also reviewed revisions to the drawings and interviewed engineering and operations personnel to ensure the modification did not affect the design of the standby liquid control system.

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.

- Standby liquid control system following temperature controller replacement on April 4, 2017
- Secondary containment ventilation inlet valve, V-28-7, following pin replacement on April 11, 2017
- Isolation condenser valve, V-14-32, following valve stem maintenance on April 11, 2017
- 'B' electromatic relief valve following pressure switch replacement on April 13, 2017
- 1-8 'B' sump pump following breaker replacement on April 18, 2017
- No. 1 emergency diesel generator following fuse replacements on May 16, 2017
- 'C' core spray pump following cable maintenance on May 31, 2017
- No. 2 emergency diesel generator following fuse replacements on June 19, 2017

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 2 samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs 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:

- 607.4.016, Containment spray and emergency service water system I pump operability and quarterly in-service test on April 24, 2017 (in-service test)
- 610.3.105, Core spray system I instrumentation channel calibration and test on June 1, 2017

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06 – 1 sample)

Training Observations

a. Inspection Scope

The inspectors observed a simulator training evolution for licensed operators on May 2, 2017, which required emergency plan implementation by an operations crew. Exelon planned for this evolution to be evaluated and included in performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crew. The inspectors also attended the post-evolution critique for the scenario. The focus of the inspectors' activities was to note any weaknesses and deficiencies in the crew's performance and ensure that Exelon evaluators noted the same issues and entered them into the corrective action program.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Occupational and Public Radiation Safety

2RS2 Occupational As Low As IS Reasonably Achievable (ALARA) Planning and Controls (71124.02 – 1 sample)

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, technical specifications, and procedures required by technical specifications as criteria for determining compliance.

Inspection Planning

The inspectors conducted a review of Oyster Creek's collective dose history and trends, ongoing and planned radiological work activities, and ALARA dose estimating and tracking procedures.

Implementation of ALARA and Radiological Work Control (1 sample)

The inspectors reviewed the results achieved against the intended ALARA estimates to confirm adequate implementation and oversight of radiological work controls. The inspectors also verified that the ALARA staff was involved with emergent work activities and were revising both dose estimates and ALARA controls in the associated radiation work permits/ALARA plans, as appropriate.

b. Findings

No findings were identified.

2RS5 Radiation Monitoring Instrumentation (71124.05 – 3 samples)a. Inspection Scope

The inspectors reviewed performance in assuring the accuracy and operability of radiation monitoring instruments used to protect occupational workers during plant operations and from postulated accidents. The inspectors used the requirements in 10 CFR 20; regulatory guides; American Nuclear Standards Institute N323A, N323D, and N42.14; and procedures required by technical specifications as criteria for determining compliance.

Inspection Planning

The inspectors reviewed Oyster Creek's UFSAR, radiation protection audits, records of in-service survey instrumentation, and procedures for instrument source checks and calibrations.

Walkdowns and Observations (1 sample)

The inspectors conducted walkdowns of plant area radiation monitors and continuous air monitors. The inspectors assessed material condition of these instruments and that the monitor configurations aligned with the UFSAR. The inspectors checked the calibration and source check status of various portable radiation survey instruments and contamination detection monitors for personnel and equipment.

Calibration and Testing Program (1 sample)

For the following radiation detection instrumentation, the inspectors reviewed the current detector and electronic channel calibration, functional testing results alarm setpoints, and the use of scaling factors: laboratory analytical instruments, whole body counter, containment high-range monitors, portal monitors, personnel contamination monitors, small article monitors, portable survey instruments, area radiation monitors, electronic dosimetry, air samplers, and continuous air monitors.

The inspectors reviewed the calibration standards used for portable instrument calibrations and response checks to verify that instruments were calibrated by a facility that used National Institute of Science and Technology traceable sources.

Problem Identification and Resolution (1 sample)

The inspectors verified that problems associated with radiation monitoring instrumentation (including failed calibrations) were identified at an appropriate threshold and properly addressed in the corrective action program.

b. Findings

No findings were identified.

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06 – 6 samples)

a. Inspection Scope

The inspectors reviewed the treatment, monitoring, and control of radioactive gaseous and liquid effluents. The inspectors used the requirements in 10 CFR 20; 10 CFR 50, Appendix I; technical specifications; Offsite Dose Calculation Manual (ODCM); applicable industry standards; and procedures required by technical specifications as criteria for determining compliance.

Inspection Planning

The inspectors conducted in-office reviews of the Oyster Creek 2015 and 2016 annual radioactive effluent and environmental reports, radioactive effluent program documents, UFSAR, ODCM, and applicable event reports.

Walkdowns and Observations (1 sample)

The inspectors walked down the gaseous and liquid radioactive effluent monitoring and filtered ventilation systems to assess the material condition and verify proper alignment according to plant design. The inspectors also observed potential unmonitored release points and reviewed radiation monitoring system surveillance records and the routine processing and discharge of gaseous and liquid radioactive wastes.

Calibration and Testing Program (1 sample)

The inspectors reviewed gaseous and liquid effluent monitor instrument calibration, functional test results, and alarm setpoints based on National Institute of Standards and Technology calibration traceability and ODCM specifications.

Sampling and Analyses (1 sample)

The inspectors reviewed radioactive effluent sampling activities, representative sampling requirements, compensatory measures taken during effluent discharges with inoperable effluent radiation monitoring instrumentation, the use of compensatory radioactive effluent sampling, and the results of the inter-laboratory and intra-laboratory comparison program including scaling of hard-to-detect isotopes.

Instrumentation and Equipment (1 sample)

The inspectors reviewed the methodology used to determine the radioactive effluent stack and vent flow rates to verify that the flow rates were consistent with technical specification/ODCM and UFSAR values. The inspectors reviewed radioactive effluent discharge system surveillance test results based on technical specification acceptance criteria. The inspectors verified that high-range effluent monitors used in emergency operating procedures are calibrated, operable, and have post-accident effluent sampling capability.

Dose Calculations (1 sample)

The inspectors reviewed changes in reported dose values from the previous annual radioactive effluent release reports, several liquid and gaseous radioactive waste discharge permits, the scaling method for hard-to-detect radionuclides, ODCM changes, land use census changes, public dose calculations (monthly, quarterly, annual), and records of abnormal gaseous or liquid radioactive releases.

Problem Identification and Resolution (1 sample)

The inspectors evaluated whether problems associated with the radioactive effluent monitoring and control program were identified at an appropriate threshold and properly addressed in Exelon's corrective action program.

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (71124.07 – 3 samples)

a. Inspection Scope

The inspectors reviewed the Radiological Environmental Monitoring Program (REMP) to validate the effectiveness of the radioactive gaseous and liquid effluent release program and implementation of the Groundwater Protection Initiative (GPI). The inspectors used the requirements in 10 CFR 20; 40 CFR 190; 10 CFR 50, Appendix I; technical specifications; ODCM; Nuclear Energy Institute (NEI) Document 07-07; and procedures required by technical specifications as criteria for determining compliance.

Inspection Planning

The inspectors reviewed: 2016 Oyster Creek Generating Station Annual Radiological Environmental Operating Report, REMP program audits, ODCM, 2016 land use census, UFSAR, and inter-laboratory comparison program results.

Site Inspection (1 sample)

The inspectors walked down various environmental dosimeters (optically stimulated luminescent dosimeters), air sampling, groundwater monitoring wells, and surface/drinking water sampling locations. The inspectors reviewed associated calibration and maintenance records.

The inspectors observed the sampling of various environmental media as specified in the ODCM and reviewed any anomalous environmental sampling events including assessment of any positive radioactivity results. The inspectors reviewed the ODCM. The inspectors verified the operability and calibration of the meteorological tower instruments and meteorological data readouts. The inspectors reviewed environmental sample laboratory analysis results, laboratory instrument measurement detection sensitivities, results of the laboratory quality control program audit, and the inter- and intra-laboratory comparison program results.

GPI Implementation (1 sample)

The inspectors reviewed: groundwater monitoring results, changes to the GPI program since the last inspection, anomalous results or missed groundwater samples, leakage or spill events including entries made into the decommissioning files (10 CFR 50.75(g)), evaluations of surface water discharges, and Exelon's evaluation of any positive groundwater sample results including appropriate stakeholder notifications and effluent reporting requirements.

The inspectors reviewed the groundwater monitoring program as it applies to selected potential leaking SSCs and the results of environmental remediation performed since the previous inspection.

Problem Identification and Resolution (1 sample)

The inspectors evaluated whether problems associated with the REMP, GPI, and Meteorological Monitoring Program were identified at an appropriate threshold and properly addressed in the corrective action program.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Unplanned Scrams, Unplanned Power Changes, and Unplanned Scrams with Complications (3 samples)

a. Inspection Scope

The inspectors reviewed Exelon's submittals for the following Initiating Events cornerstone performance indicators for the period of April 1, 2016, through March 31, 2017.

- Unplanned Scrams
- Unplanned Power Changes
- Unplanned Scrams with Complications

To determine the accuracy of the performance indicator data reported during those periods, inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7.

The inspectors reviewed Exelon's operator narrative logs, maintenance planning schedules, condition reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

.2 Safety System Functional Failures (1 sample)

a. Inspection Scope

The inspectors sampled Exelon's submittals for the Safety System Functional Failures performance indicator for the period of April 1, 2016, through March 31, 2017. To determine the accuracy of the performance indicator data reported during those periods, inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 10 CFR 50.73." The inspectors reviewed Exelon's operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, condition reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

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 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 Annual Sample: Follow-up of a Green Non-Cited Violation (NCV) for Failure to Identify a Condition Adverse to Quality

a. Inspection Scope

The inspectors performed an in-depth review of Exelon's evaluation and corrective actions associated with a NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," because Exelon did not promptly identify and correct a condition adverse to quality. Specifically, Exelon did not identify that the scram time test result for control rod drive (CRD) 18-47 was beyond the analyzed scram time, which resulted in a degraded CRD. In May 2015, Exelon failed to identify that CRD 18-47 was slow and failed to implement industry guidance in General Electric Service Information Letter 173, Supplement 1, Revision 1, to scram time test control rod drive mechanisms to which cooling water was isolated to as soon as practical. The inspectors reviewed actions taken by Exelon to address this condition adverse to quality, which is documented in Inspection Report 05000219/2016001. Additionally, the inspectors reviewed Licensee Event Report (LER) 05000219/2016-002-00 for any updates to determine if any additional corrective actions had been performed following the licensee's apparent cause evaluation of the issue.

The inspectors assessed Exelon's evaluation, extent of condition review, completed corrective actions, and the prioritization and timeliness of actions to evaluate whether the corrective actions were appropriate. The inspectors reviewed the actions to revise the System Engineering CRD Performance Monitoring Plan to specifically require review of full core scram time data and to compare with previous CRD scram time data, and then document and evaluate any discrepancies. The inspectors reviewed a procedure change for NF-OC-721-1100, "Selection of Control Rods for Scram Time Testing."

b. Findings and Observations

No findings were identified.

The inspectors determined Exelon's evaluation appropriately identified the causes and that corrective actions were adequate to resolve the failure to identify conditions adverse to quality in full core scram time data. The inspectors also determined that the corrective actions were reasonable and would address the recommendations in General Electric Service Information Letter 173. LER 2016-002-00 documented that scram time testing should have been performed per Technical Specification 4.2.C.2. The LER stated in the corrective action section that "Corrective actions will be determined by the apparent cause evaluation and included in this LER." The inspectors identified that Exelon had not updated the NRC with a LER supplement. The inspectors also identified that Exelon's corrective actions had not revised the procedure to isolate cooling water to CRDs, to require scram time testing per Technical Specification 4.2.C.2. This would be a procedural enhancement to ensure that scram time testing is performed after isolating cooling water. Exelon wrote IR 4011905 to update the NRC on the corrective actions taken by Exelon, and develop procedural guidance for scram time testing CRDs after isolating cooling water to a CRD mechanism. Exelon will issue a supplement to the LER. These issues screened to minor in accordance with IMC 0612, Appendix B, because these issues did not adversely affect any of the cornerstone objectives and also since the LER was issued, Exelon has not isolated the cooling water to a CRD mechanism at Oyster Creek. The inspectors verified that since maintenance was performed to replace CRD 18-47 during the last refueling outage, no CRDs have had cooling water isolated.

.3 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 documented by Exelon in trend reports, site performance indicators, major equipment problem lists, system health reports, maintenance rule assessments, control room deficiencies, operator workarounds, operability evaluations and maintenance or corrective action program backlogs. The inspectors also reviewed Exelon's corrective action program database for the first and second 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 NRCs daily condition report review. In addition, the inspectors performed a focus review on an adverse trend in work documentation and record retention to assess whether Exelon was appropriately prioritizing and resolving work documentation issues. This focused review also considered the impacts of shutdown and decommissioning activities on the plant as it pertained to work prioritization and documentation.

b. Findings and Observations

No findings were identified.

The inspectors did not identify any new issues or adverse trends not already addressed within the scope of the corrective action program, which could be indicative of a more significant safety issue. The inspectors concluded that Exelon continued to identify problems and adverse trends at a low threshold, entered those issues into the corrective action program for resolution, and was appropriately prioritizing, evaluating, and correcting issues before they became a more significant safety concern.

The inspector's focused review on work documentation and record retention concluded that Exelon was appropriately prioritizing and resolving issues.

4OA6 Meetings, Including Exit

On July 12, 2017, 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
 I. Abelev, System Engineer
 J. Anvari, System Engineer
 M. Arnao, Director, Maintenance
 D. Cappoferri, Manager, Maintenance
 M. Chanda, Manager, Emergency Preparedness
 J. Chrisman, Radiation Protection Tech Support Manager
 J. Clark, Manager, Environmental/Chemistry
 L. Dorman, System Engineer
 R. Dutes, Regulatory Assurance Specialist
 G. Flesher, Regulatory Assurance Manager
 G. Flessner, Manager, Fleet Assessment
 J. Jimenez, Senior Regulatory Assurance Specialist
 F. Jordan, Reactor Engineering Manager
 T. Keenan, Manager, Site Security
 A. Krukowski, Shift Operations Superintendent
 J. McCarthy, Decommissioning Health Physicist
 M. Nixon, Senior Environmental Chemist
 J. Raby, Radiation Protection Instrument Supervisor
 H. Ray, Senior Manager, Design Engineering
 J. Renda, Director, Work Management
 M. Rossi, Licensed Operator Requalification Training Lead
 J. Stanley, Director, Engineering
 C. Symonds, Director, Training
 G. Test, Chemistry Technician
 J. Urbanek, Radiation Protection Technician
 W. Wasty, System Engineer
 T. Weeks, Chemistry Technician
 J. Weissinger, Director, Operations
 K. Wolf, Manager, Radiation Protection

State of NJ Inspectors:

Karin Tuccillo, Supervisor, Nuclear Environmental Engineering Section
 Paul Schwartz, Nuclear Environmental Engineer

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATEDOpened/Closed

05000219/2017002-01	FIN	Inadequate Assessment of Degraded Fuel Oil Filter Impact to Emergency Diesel Generator Operability (Section 1R15)
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LIST OF DOCUMENTS REVIEWED**Section 1R01: Adverse Weather Protection**Procedures

ABN 60, Grid Emergency, Revision 19
 328, Turbine Building Heating and Ventilation System, Revision 66
 328.1, Battery Room "C" HVAC, Revision 22
 341, Emergency Diesel Generator Operation, Revision 114
 EN-OC-402-0005, Extreme Heat Implementation Plan, Revision 0

OP-OC-108-109-1001, Severe Weather Preparation T&RM for Oyster Creek, Revision 38
 OP-AA-108-111-1001, Severe Weather and Natural Disaster Guidelines, Revision 16

Condition Reports

1188389	2634886	3983559	3989621	4004048	4022114
4023491					

Work Orders

4625781	4626326	4585685	4379988	4382974
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Miscellaneous

2017 Certification of Oyster Creek Generating Station Summer Readiness, dated May 15, 2017

Section 1R04: Equipment AlignmentProcedures

341, Emergency Diesel Generator Operation, Revision 114
 308, Emergency Core Cooling System Operation, Revision 98
 610.4.021, Core Spray System 1 Pump Operability and Quarterly In-Service Test, Revision 33
 307, Isolation Condenser System, Revision 127

Drawings

GE 885D781, Core Spray System Flow Diagram, Sheet 1, Revision 76
 GE 3E-243-21-1000, Drywell and Torus Vacuum Relief System, Sheet 1, Revision 29
 GE 148F262, Emergency Condenser Flow Diagram, Sheet 1, Revision 55

Section 1R05: Fire ProtectionProcedures

OP-OC-201-008, Oyster Creek Pre-fire Plans, Revision 26
 OP-OC-201-008-1025, 4160V "C" and "D" Vaults, Revision 1
 OP-OC-201-008-1027, Turbine Building Basement South (3'-6" Elevation), Revision 2
 OP-OC-201-008-1029, Feed Pump Room (0'-6" & 3'-6" Elevations), Revision 1
 OP-OC-201-008-1009, Reactor Building (-19' Elevation) RBEDT Room, Revision 0
 OP-OC-201-008-1031, Turbine Building Basement/Mezzanine (0'0" Elevation) North End (27'-0" Elevation), Revision 6
 OP-OC-201-008-1032, Turbine Operating Floor (46'-0" Elevation), Revision 1
 OP-AA-201-003, Fire Drill Performance, Revision 16
 ER-AA-600-1069, High Risk Fire Area Identification, Revision 4
 OP-AA-201-012-1001, Operations On-line Fire Risk Management, Revision 1
 OP-OC-201-012-1001, On-line Fire Risk Management, Revision 4
 101.2, Oyster Creek Site Fire Protection Program, Revision 73

ABN 29, Plant Fires, Revision 29
RAP-LFAP FD-665-700, Panel FD-665-700 Alarm and Trouble, Revision 4

Condition Report
4014615

Miscellaneous
Fire Drill Record, dated May 24, 2017

Section 1R06: Flood Protection Measures

Procedure
ER-AA-300-150, Cable Condition Monitoring Program, Revision 4

Maintenance Orders/Work Orders
4594592 4390804 4375451

Miscellaneous
ESW 1-3 HVA Tan Delta Test Report, dated October 2, 2012
ESW 1-4 HVA Tan Delta Test Report, dated February 26, 2013
1-1 Circ Water Pump Motor HVA Tan Delta Test Report, dated April 25, 2016
1-3 Circ Water Pump Motor HVA Tan Delta Test Report, dated April 28, 2016
1-4 Circ Water Pump Motor HVA Tan Delta Test Report, dated April 21, 2016
CableWise Test Report 2013-198, dated September 19, 2013
Technical Evaluation 2671067-04, Acceptability of CableWise Cable Test Data,
dated May 26, 2016

Section 1R11: Licensed Operator Requalification 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
610.3.105, Core Spray System 1 Instrument Channel Calibration and Test, Revision 67

Miscellaneous
EP SCEN 73, Oyster Creek Station Licensed Operator Requal Training Simulator Exercise
Guide, Revision 0

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
ER-AA-310-1005, Maintenance Rule – Dispositioning Between (a)(1) and (a)(2), Revision 7
SM-AA-300, Procurement Engineering Support Activities, Revision 7
SM-AA-300-1001, Procurement Engineering Process and Responsibilities, Revision 21
CC-AA-320-1002, Dynamic (Seismic) Qualification for Alternate Replacement Items and
Commercial Grade Dedication Items
CC-AA-320-2004, Dynamic Screens Alphabetic P-Through-R, Revision 2
307, Isolation Condenser, Revision 127

Condition Reports

3993499	4012243	4009112	3996847	3994649	3980135
3978136	3970273	3970272	3968888	3964521	3964517
3962279	3959583	3957109	3954472		

Miscellaneous

PEEVAL 102210, Commercial Grade Dedication of Thermometrics P/N: H040-00000003
 Thermistor, 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 24
 OP-AA-108-117-1000, Oyster Creek Protected Equipment Program, Revision 12
 OP-MA-109-101, Clearance and Tagging, Revision 22
 WC-OC-101-1001, Online Risk Management and Assessment, Revision 21
 OP-AA-111-101, Operating Narrative Logs and Records, Revision 13
 636.4.003, Diesel Generator #1 Load Test, Revision 105
 610.3.105, Core Spray System 1 Instrument Channel Calibration and Test, Revision 67

Condition Reports

4023663 4649614

Maintenance Orders/Work Orders

4603688

Section 1R15: Operability Determinations and Functionality Assessments

Procedures

RAP-G8b, Tank Temp Hi/Lo, Revision 1
 304, Standby Liquid Control System Operation, Revision 48
 308, Emergency Core Cooling System Operation, Revision 98
 312.10, Secondary Containment Control, Revision 25
 665.5.002, Secondary Containment Leak Rate Test, Revision 33
 651.4.002, Standby Gas Treatment System 15-Minute Run – System 1, Revision 16

Condition Reports

3993499	3962412	3986258	4005193	3999576	3990799
4013806	4015003	4008268	4006981	1547168	

Drawings

GE 148F723, Liquid Poison System Flow Diagram, Sheet 1, Revision 40
 EM 8393039, Emergency Diesel Generator #1 Electrical Elementary Wiring Diagram, Sheet 3,
 Revision 13
 EM 8393039, Emergency Diesel Generator #1 Electrical Elementary Wiring Diagram, Sheet 7,
 Revision 5

Maintenance Orders/Work Orders

4589127 4603688 R2249792 R2282459

Calculations

C-1302-741-E310-014, Voltage Analysis for EDG Control Circuits, Revision 2
C-1302-862-5360-002, Diesel Generator Fuel Requirements, Revision 6
C-1302-822-E150-066, Secondary Containment Integrity Calculation, Revision 2
C-1302-822-2250-024, Secondary Containment Integrity, Revision 0

Miscellaneous

PEEVAL 100916, IEE for Love Controls Temperature Controller and 1772423-2 Thermistor for TIS-IL-0009, Revision 0
Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report, Section 9.3, Process Auxiliaries, Revision 16
Oyster Creek Nuclear Generating Station Technical Specifications, Section 3.2, Reactivity Control, Amendment 262
Engineering Change 619721, EDG-1 LVR Fuse Evaluation, May 17, 2017
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 3.5, Containment, Amendment 168

Section 1R18: Plant Modifications

Procedures

304, Standby Liquid Control System Operation, Revision 48
681.4.004, Technical Specification Log Sheet, Revision 35
312.9, Primary Containment Control, Revision 64

Calculations

C-1302-243-E120-078, Torus Expected Level & In-leakage Determination, Revision 0
C-1302-243-2236-043, Torus Level Leak Rate, Revision 0
C-1302-573-E320-010, Drywell Unidentified Leakage Error Calculation, Revision 0

Condition Reports

3971702 4020588 4023488

Drawings

BR 3044, Misc. Connection Diagrams, Sheet 1, Revision 36
GE 148F723, Liquid Poison System Flow Diagram, Sheet 1, Revision 40
GE 885D781, Core Spray System Flow Diagram, Sheet 1, Revision 76

Maintenance Orders/Work Orders

4589127

Miscellaneous

PEEVAL 100151, IEE for Installation of Love temperature Controller to Replace Fenwal Temperature Controller for TIS-IL-00009, Revision 0
PEEVAL 100916, IEE for Love Controls Temperature Controller and 1772423-2 Thermistor for TIS-IL00009, Revision 0
PEEVAL 102210, Commercial Grade Dedication of Thermometrics P/N: H040-00000003 Thermistor, Revision 0
OC-2017-S-0032, Technical Specification Log Sheet 50.59 Screening, Revision 0
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 6.15, Integrity of Systems Outside Containment, Amendment 191

Oyster Creek Nuclear Generating Station Technical Specifications, Section 3.3, Reactor Coolant, Amendment 133

Section 1R19: Post-Maintenance Testing

Procedures

304, Standby Liquid Control System Operation, Revision 48

654.2.001, Reactor Building Ventilation Supply Valve Position Indication Check, Revision 23

609.4.001, Isolation Condenser Valve Operability and In Service Test, Revision 83

602.3.004, Electromatic Relief Valve Pressure Sensor Test and Calibration, Revision 57

420, Instrumentation Setpoints, Revision 17

636.4.003, Diesel Generator #1 Load Test, Revision 105

610.3.105, Core Spray System 1 Instrument Channel Calibration and Test, Revision 67

610.4.021, Core Spray System 1 Pump Operability and Quarterly In-Service Test, Revision 33

636.4.013, Diesel Generator #2 Load Test, Revision 53

341, Emergency Diesel Generator Operation, Revision 114

Calculations

C-1302-622-E510-060, PS-IA-0083, EMRV High Pressure Relief Calibration and Instrumentation Loop Error, Revision 0

Condition Reports

3971702	3985845	3998762	3998744	3998885	3983193
4011133	4011152	4011155	4011263	4017218	4016306
4023265	3983554	4018842			

Drawings

EM-8397907, Emergency Diesel Generator #2 Electrical Elementary Wiring Diagram AC & DC Auxiliaries, Sheet 7, Revision 5

EM-8397907, Emergency Diesel Generator #2 Electrical Elementary Wiring Diagram Generator Cabinet – Lower Right, Sheet 14, Revision 3

Maintenance Orders/Work Orders

4589127	4381084	4348309	3988190	3843333	4616252
4340412	4360375	4360986	3998369	2502999	4627188
4626971	4603688	4183415	4649617		

Miscellaneous

Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report, Section 9.3, Process Auxiliaries, Revision 16

Oyster Creek Nuclear Generating Station Technical Specifications, Section 3.2, Reactivity Control, Amendment 262

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 3.5, Containment, Amendment 100

Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report, Section 6.3, Emergency Core Cooling System, Revision 18

Oyster Creek Nuclear Generating Station Technical Specifications, Section 3.8, Isolation Condenser, Amendment 241

Oyster Creek Nuclear Generating Station Technical Specifications, Section 3.4,
Emergency Cooling, Amendment 247
Oyster Creek Nuclear Generating Station Technical Specifications, Section 3.3,
Reactor Coolant, Amendment 133
Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report, Section 9.3,
Process Auxiliaries, Revision 16
Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report, Section 11.2,
Liquid Waste Management System, Revision 18
Oyster Creek Nuclear Generating Station Technical Specifications, Section 3.7, Auxiliary
Electrical Power, Amendment 278
Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report, Section 8.3,
Onsite Power Systems, Revision 18
EC-619166, TCCP for Drywell Sump 1-8 to only Operate Sump Pump 1-8A, Revision 0
EC-619915, Installation Requirements for Raychem In-Line Type, Motor Connection Kits,
Revision 0
Engineering Evaluation 0035-87, Instructions for Tape Wrapping Electrical Connection Using a
Barrel Connector and Raychem HVBT, dated December 11, 2007

Section 1R22: Surveillance Testing

Procedures

607.4.016, Containment Spray and Emergency Service Water System I Pump Operability and
Quarterly In-Service Test, Revision 45
610.3.105, Core Spray System 1 Instrument Channel Calibration and Test, Revision 67

Maintenance Orders/Work Orders

4386933

Miscellaneous

Oyster Creek Nuclear Generating Station Technical Specifications, Section 3.1,
Protective Instrumentation, Amendment 208
Oyster Creek Nuclear Generating Station Technical Specifications, Section 3.4,
Emergency Cooling, Amendment 247
Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report, Section 6.3,
Emergency Core Cooling System, Revision 18

Section 1EP6: Drill Evaluation

Procedures

EP-AA-112-100, Control Room Operations, Revision 14
EP-AA-112-100-F-01, Shift Emergency Director Checklist, Revision W
EP-MA-114-100-F-04, PAR Notification/Update Form, Revision G
EP-AA-112-100-F-06, ERO Notification or Augmentation, Revision V

Condition Reports

4007191 4007184 4007169 4007176 4007178

Miscellaneous

EP SCEN 73, Oyster Creek Station Licensed Operator Requal Training Simulator
Exercise Guide, Revision 0

Section 2RS2: Occupational ALARA Planning and ControlsProcedures

RP-AA-401, Operational ALARA Planning and Controls, Revision 22

Miscellaneous

2017 Monthly Business Plan Dose Goals, June 21, 2017

Section 2RS5: Radiation Monitoring InstrumentationAction Reports

2612772	2612842	2612921	2613241	2614778	2627268
2629730	2639390	2657649	2664456	2675201	2685588
2688989	2689850	2692450	2695051	2696072	2696670
2707622	2707972	2709632	2716868	3951829	3952677
3957450	3959241	3967027	3974814	4016598	4020563
4023177					

Instrument CalibrationsPlant Installed Instruments:

612.3.030, Containment High Range Radiation Monitoring System, Revision 16, RE 790, RE 791, 9/28/2014 and 9/29/2016

621.4.044, Stack and Turbine Building RAGEMS HRM and Turbine Building LRM Source Checks, Revision 38, 4/11/2017, 5/10/2017

621.3.043, Service Water Radiation Monitor Functional Test, Revision 14, 12/27/16

621.3.045, Turbine Building RAGEMS Sample and Effluent Flow Functional Test, Revision 14, 11/8/2016, 2/20/2017

621.3.037, Turbine Building RAGEMS Noble Gas Monitor Functional Test, Revision 30, 1/13/2017, 4/26/2017

621.3.024, Stack RAGEMS Sample and Effluent Flow Functional Test, Revision 5, FI-661-503, 1/10/2017, 4/3/2017

621.3.026, Stack RAGEMS Noble Gas Monitor Functional Test, Revision 34, 11/11/2016, 2/7/2017

621.3.041, Service Water Radiation Monitoring System Calibration, Revision 16, 2/6/2013, 12/14/2014

621.3.021, AOG Ventilation Radiation Monitoring System Channel Calibration, Revision 34, 9/21/2015, 11/18/2016

621.3.034, Turbine Building RAGEMS Sample and Effluent Flow-Calibration, Revision 16, 12/16/2015, 1/6/2017

621.3.023, Stack RAGEMS Sample and Effluent Flow Calibration, Revision 27 and Revision 28, 12/18/2014 Revision 27, 4/13/2017 Revision 28

621.3.036, Turbine Building Noble Gas Channel Calibration, Revision 12 and Revision 14, 6/27/2014 Revision 12, 12/28/2016 Revision 14

621.3.025, Stack RAGEMS Noble Gas Monitor Calibration, Revision 32 and Revision 33, 4/26/2014 Revision 32, 10/24/2016 Revision 33

Available Instruments:

<u>Model</u>	<u>Serial#</u>	<u>Bar code#</u>	<u>Recent Calibration</u>	<u>Previous Calibration</u>
RAD-Pro 5	20110102016	0012565	4/1/17	4/18/16
L-3030P	275366	0012725	5/1/17	4/4/16
Radeco	700471	0014684	9/17/16	10/2/14
L-177	27358	700494	4/10/17	4/5/16
Gilair 5	20101001007	0017109	3/27/17	2/17/16
RO20AA	11903	0015201	8/9/16	6/9/15
L- 3/HP-270	25767	0017790	10/3/16	9/21/15
RDS-30	360780	0018932	9/28/16 (Initial)	
ASP-1/NRD	317/710283	0018976	10/19/16 (initial post long storage)	
RO-7	236	0018687	7/26/16	
RM-25	383	076169	10/4/16	10/25/15
RO-2A	None	330369	2/1/17	4/15/16
AMS-4	1755	076632	3/30/17	4/1/16
ASP2/2E				
With HP 270	0337/002700	073311	1/16/17	9/14/16
RO20	005001	077706	8/5/16	3/24/15
MicroRem	B395Y	077458	3/21/17	10/8/16
AMP-100	5098-118	078872	1/23/17	6/2/16
ASP2E/NRD	0417	077675	8/11/16	6/4/15
AMP-200	7707-015	0010387	1/26/17	11/25/16

Issued Instruments:

<u>Model</u>	<u>Serial#</u>	<u>Bar code#</u>	<u>Recent Calibration</u>	<u>Previous Calibration</u>
BAK-2270	6613-093	0017242	7/27/16	2/12/16
RO-20	0422	076452	11/16/16	11/16/15
ARGOS 5AB	1104-048	1104-048	12/15/16	4/30/14
SAM-12	158	158	1/19/17	1/20/16
PM-7	442	442	8/12/16	Not Avail
AMS-3	700052/701861	700052/701861	1/11/17	1/9/16
E-140	1254	0015537	10/6/16	11/30/15
SAM-11	702316	702316	08/23/16	8/25/15
SAM-9	702318	702318	08/18/16	8/19/15
PM-7	609	702457	3/10/17	3/10/16
PM-12	1403	PM12002	10/17/16	9/10/15

Laboratory Counting Instruments:

GeLi Detectors #1 and #2

Mixed Gamma in 1.0 L Solid in 130G GA-MA Beaker
Eckert & Ziegler SN 97833 Reference Date: 1/1/2016

GeLi Detector #3

Mixed Gamma in 500 mL Solid in 500 mL Square Wide Mouth HDPE Nalgene Bottle
Eckert & Ziegler SN 102640 Reference Date: 7/1/2014

GeLi Detectors #4 and #5

Mixed Gamma in 1.0 L Solid in 130G GA-MA Beaker
Eckert & Ziegler SN 97834 Reference Date: 1/1/2016

JL Shepherd Box Irradiator Model 89 (400 Ci, 130 mCi Cs-137, on April 5, 1983)

Date of Last Calibration 3/7/2017

Equipment used for calibration:

Electrometer Control Unit RAD CAL Corporation Model 2026C SN 26-1498

RAD CAL Corporation 3 cc probe SN 4937 cal due 6/29/2017

RAD CAL Corporation 180 cc probe SN 6917 cal due 6/29/2017

Ludlum 9DP Pressurized Ion Chamber SN 25007747 Cal Cert 118450SAL due 7/1/2017

Canberra Fast Scan Whole Body Counter

Date of Last Calibration 9/2/2016

Canberra Calibration Report OC-16-005 dated 9/2/2016

Mixed gamma in Wheaton Liquid Scintillation vial

Eckert & Ziegler SN H103003 Reference Date: 4/1/2016

Ludlum Model 1000 Digital Scaler (Alpha Scintillation) SN 700487 Calibration Due 8/30/2017

Thermal Analytical Th-230 Source SN 1975-94 (21,400 dpm on 11/8/1994)

Ludlum Model 2000 Digital Scaler with (GM-Tube) SN 25361 Calibration Due 4/20/2018

Thermal Analytical Tc-99 Source SN 2151/90 (5,390 dpm on 6/10/1991)

Ludlum Model 2609110 Digital Scaler (Alpha Scintillation) Calibration Due 8/25/2017

Thermal Analytical Th-230 Source SN 1975-94 (21,400 dpm on 11/8/1994)

Rem Ball SN AM20023-016 Due 11/11/2017

2017 Annual Verification of Calibration Sources at Thermo Fisher's Calibration Facility
Technical Support Document No. 17-050 Rev 00 April 24, 2017

Other Sources Evaluated:

Cs-137 1000 Ci Well SN 371

Cs-137 10 Ci Well SN 375

Cs-137 10 mCi Track SN 733

Cs-137 40 Ci and 250 mCi Box SN 8035

PuBe Well SN 10205

Section 2RS6: Radioactive Gaseous and Liquid Effluent TreatmentProcedures

621.3.023, Stack RAGEMS Sample and Effluent Flow Calibration, Revision 28

CY-OC-120-950, Air Ejector Off Gas, Revision 18

CY-AA-170-2300, Determination of Carbon-14 in Gaseous Effluents, Revision 0

Miscellaneous

- Annual Radioactive Effluent Release Report for 2015, includes the Offsite Dose Calculation Manual (ODCM)
- Annual Radioactive Effluent Release Report for 2016, includes the Offsite Dose Calculation Manual (ODCM)
- Augmented Offgas (AOG) Ventilation Radiation Monitor Alarm Set Point Determination, dated 8/22/08
- Census, Annual Land Use, Normandeau Associates, dated 11/16/2016
- Chemistry Calculation and Position Paper, "Demonstrate that Oyster Creek Generating Station is Currently Meeting the Requirements of 10 CFR Part 20.1301", dated 8/29/2016
- Cross-Check Program Results, Eckert & Ziegler, Oyster Creek, 2Q2017
- Cross-Check Program Results, Eckert & Ziegler, Three Mile Island (for Exelon environmental samples), 3Q2016
- Groundwater Remediation Process Sample Report, Continuous Release, dated 5/3/2017
- Groundwater Remediation Process Sample Report, Continuous Release, dated 5/15/2017
- Groundwater Remediation Process Sample Report, Continuous Release, dated 6/2/2017
- Inspection Report, ANI Nuclear Liability, dated 3/31/2011
- List, Augmented Off-Gas System work order status OC-2006-S-0301, Revision 000, ECR 06-00740, 10 CFR 50.59 Screening for TCCP for Installation of a Temporary Radwaste Storage Tank Radiation Protection Calculation and Position Paper, "Steam Jet Air Ejector Off-Gas Radiation Monitor Set-Point Evaluation", dated 11/11/2016
- Self-Assessment, AR3950389
- Self-Assessment, AR1657492
- Self-Assessment, AR1193334-02
- Stack Radiation Gas Emissions Monitoring System (RAGEMS) Low Range Radiation Monitor Alarm Set Point Determination, dated 8/22/08
- Technical Specifications, Docket No. 50-219
- TSD 09-004, Revision 01, "Radiological Dose Assessment for Post-Accident Stack RAGEMS Sampling at Oyster Creek Nuclear Station".
- Updated Final Safety Analysis Report (UFSAR), Revision 18
- Worksheet for Listing of 10 CFR 50 Appendix I Doses and Actual Doses, CY-OC-170-201, Revision 2, dated 2/29/2016
- Worksheet for Listing of 10 CFR 50 Appendix I Doses and Actual Doses, CY-OC-170-201, Revision 2, dated 6/30/2016
- Worksheet for Listing of 10 CFR 50 Appendix I Doses and Actual Doses, CY-OC-170-201, Revision 2, dated 11/30/2016

Action Reports

2544104	2553800	2569339	2580318	2583531	2585692
2588630	2589314	2596928	2599221	2624411	2624961
2703484	2704993	2714063	2720787	3960189	4024272

Work Orders

4361068	4366678	R2197822	R2201466	R2209942	R2224329
R2226085	R2229067	R2234202	R2247626	R2262051	

Section 2RS7: Radiological Environmental Monitoring Program

Procedures

CY-AA-170-000, Radioactive Effluent and Environmental Monitoring Program, Revision 5
 CY-AA-170-100, Radiological Environmental Monitoring Program, Revision 2
 CY-AA-170-1000, Radiological Environmental Monitoring Program and Meteorological Program Implementation, Revision 8
 CY-AA-170-1100, Quality Assurance for Radiological Monitoring Program, Revision 1
 CY-OC-120-1200, REMP Sample Collection - Well Water, Revision 1
 CY-AA-120-420, Domestic Water Sample Collection, Revision 10
 CY-AA-120-703, Radwaste System and Tritium Remediation Liquid Composite Sample Preparation, Revision 2
 CY-AA-130-200, Quality Control, Revision 12
 CY-AA-130-201, Radiochemistry Quality Control, Revision 2
 CY-OC-170-3010, Cross Reference of Technical Specifications, ODCM Requirements and Compliance Requirements, Revision 3
 EN-AA-408, Radiological Ground Water Protection Program, Revision 0
 EN-AA-408-4000, Radiological Ground Water Protection Program Implementation, Revision 6
 CY-OC-408-4001, RGPP Onsite and Offsite Sample Results Comparison, Revision 1
 EN-OC-408-4160, RGPP Reference Material for Oyster Creek, Revision 7
 RP-AA-228, 10CFR 50.75(g) and 10CFR 72.30 (d), Revision 1
 Murray and Trettel, Inc, P1009 Procedure Manual Met Monitoring Program Equipment Servicing and Data Recovery Procedures Manual, Revision 29
 Normandeau Associates, Inc. Procedure, Collection of Groundwater Samples for Radiological Analysis (Radiological Groundwater Protection Program), Revision 3
 Normandeau Associates, Inc. Procedure ER-OCGS-04, Collection of Food Products and Broad Leaf Vegetation Samples for Radioactive Analysis (OCGS), Revision 4
 Normandeau Associates, Inc. Procedure ER-OCGS-05, Collection of Air Iodine and Air Particulate Samples for Radiological Analysis (OCGS), Revision 6
 Normandeau Associates, Inc. Procedure ER-OCGS-06, Collection of Water Samples for Radiological Analysis (OCGS), Revision 6
 Normandeau Associates, Inc. Procedure ER-OCGS-07, Performance of Annual Land Use Census (OCGS), Revision 2
 Landauer Procedure L313A Analyzing InLight Dosimeters, Revision 8
 Landauer Procedure L312A Receiving InLight Dosimeters and Associated Components, Revision 4

Audits, Self-Assessments, and Surveillances

EXELON Audit Report VA-13-010 Vendor Quality Assurance Audit – Landauer, Inc., Glenwood, IL (NUPIC Supplier 4059), December 4, 2013
 EXELON Audit Report SR-2016-30, EXELON Supplier Audit of Landauer, Inc., Glenwood, IL, August 26, 2016
 EXELON Audit Report SR-2012-30 Vendor Quality Assurance Audit – Murray & Trettel, Inc., Palatine, IL, January 16, 2013
 NUPIC Audit 23484 Vendor Quality Assurance Audit Teledyne Brown Engineering, Knoxville, TN (NUPIC Supplier 2427), October 15, 2013
 NUPIC Audit 24191 Vendor Quality Assurance Audit Teledyne Brown Engineering, Knoxville, TN (NUPIC Supplier 2427), July 8, 2016
 EXELON NOS-OYS-16-04 (AR 2673175) Chemistry, Radwaste and Environmental Monitoring Audit Report, July 13, 2016

PI-AA-126-1005-F-01, Check-in Self-assessment, AR 3950389, Radiological Environmental Monitoring Program, January 4, 2017
 EPRI Groundwater Protection Program Self-assessment for Oyster Creek Generating Station, October 2013

Condition Reports

1471161	2564960	2672889	2686626	2687585	2694245
2707244	2721028	3957441	4014796	4023858	4024279

Miscellaneous

EXELON Oyster Creek Generating Station Unit 1 Annual Radiological Environmental Operating Reports – 2016, April 28, 2016
 Normandeau Associates, Inc., Quality Assurance Program, March 2010
 Landauer, Inc., Quality Assurance Manual, July 6, 2012
 Teledyne Brown Engineering Inc., Quality Assurance Manual for Environmental Services, Revision 24
 Oyster Creek Documents Generated by RP-AA-228 - 10CFR50.75 (g) Decommissioning Records, March 30, 2017
 Murray & Trettel, Inc, Oyster Creek Meteorological Calibration, February 21, 2017
 Murray & Trettel, Inc, Oyster Creek Meteorological Calibration, June 22, 2017
 Murray & Trettel, Inc, Annual Report on the Meteorological Monitoring Program at Oyster Creek Generating Station – December 2016
 Normandeau Associates, Inc. Oyster Creek 2016 Annual Land Use Census, November 16, 2016
 Powerlab Air Sampler Orifice Calibration data – 2693411(A/P # 73) Calibrated March 31, 2016, 2693413 (A/P #66) Calibrated March 31, 2016, and 2693416 (A/P #20) Calibrated March 31, 2016. All three calibrated orifices were installed February 22, 2017
 Normandeau Associates, Inc., Groundwater Well Inspection/ Maintenance Log, April 3, 2017
 CHD, Hydrological Investigation Report for Oyster Creek Generating Station, Forked River, NJ, October 2016
 MISTRAS, Long Range Guided Wave Ultrasonic Pipe Screening Results, Technical Report AM4551-576937 for WO#C2028161, 30"-AE-01 and 48"-AE-01 Off Gas Line, March 28, 2014
 MISTRAS, Long Range Guided Wave Ultrasonic Pipe Screening Results, OC 30"-AE-01 and 48"-AE-01 Off Gas Line, April 1, 2016

Section 40A1: Performance Indicator Verification

Procedures

ABN 1, Reactor Scram, Revision 13

Miscellaneous

NUREG 1022, Reporting Requirements, Revision 3
 NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 7
 Various Operator Logs from April 1, 2016 to March 31, 2017
 Performance Indicator Summary Report, dated April 2017

Section 40A2: Problem Identification and Resolution

Procedures

NF-OC-721-1100, Selection of Control Rods for Scram Time Testing, Revision 2
 617.4.003, Control Rod Scram Insertion Time Test and Valve IST Test, Revision 55
 RAP H5c, CRD Temp HI, Revision 6
 ER-AA-330-009, ASME Section XI Repair/Replacement Program, Revision 13

Condition Reports

2641454	2642325	2642334	2642346	2643603	4011905
3962128	3975257	3959349	2736322	2742749	3954016
3954051	3955270	2736322	2739733	2742131	2742129

LIST OF ACRONYMS

AC	alternating current
ALARA	as low as is reasonably achievable
CFR	<i>Code of Federal Regulations</i>
CRD	control rod drive
GPI	Groundwater Protection Initiative
IMC	Inspection Manual Chapter
IR	issue report
LER	licensee event report
NCV	non-cited violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
REMP	Radiological Environmental Monitoring Program
SSC	structure, system, or component
UFSAR	Updated Final Safety Analysis Report