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

August 2, 2016

EA-16-102

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

SUBJECT: OYSTER CREEK NUCLEAR GENERATING STATION - INTEGRATED INSPECTION REPORT 05000219/2016002 AND INDEPENDENT SPENT FUEL STORAGE INSTALLATION REPORT 07200015/2016001 AND EXERCISE OF ENFORCEMENT DISCRETION

Dear Mr. Hanson:

On June 30, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Oyster Creek Nuclear Generating Station. The enclosed report documents the inspection results, which were discussed on July 6, 2016, with Mr. Garey Stathes, Site Vice President, and other members of your staff.

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

The inspectors documented one finding of very low safety significance (Green) in this report. This finding involved a violation of NRC requirements. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

In addition, the NRC reviewed Licensee Event Report 05000219/2015-003-00, which described the circumstances associated with a failed electrical relay assembly which caused emergency diesel generator No. 1 to be inoperable for a total of 15 days in October and November 2015. This period exceeded the allowed outage time of seven days detailed in Technical Specification 3.7.C.2.b, and therefore, is a violation of technical specifications. Regional staff performed a risk evaluation and determined the issue was of low to moderate safety significance (White).

Although this issue constitutes a violation of NRC requirements, the NRC determined that the relay failure which caused the emergency diesel generator to be inoperable was not within Exelon's ability to reasonably foresee and correct. As a result, the NRC did not identify a performance deficiency associated with this condition. The NRC's assessment considered Exelon's maintenance practices, industry operating experience, vendor and industry maintenance and testing recommendations for the failed relay as well as similar components, and Exelon's corrective actions to prevent recurrence of the issue.

Based on the results of the NRC's inspection and assessment, I have been authorized, after consultation with the Director, Office of Enforcement, to exercise enforcement discretion in accordance with NRC Enforcement Policy Section 2.2.4, "Exceptions to Using Only the Operating Reactor Assessment Program," and Section 3.5, "Violation Involving Special Circumstances." The Region I Regional Administrator was also consulted regarding enforcement discretion for this issue.

If you contest the non-cited violation in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Oyster Creek Nuclear Generating Station.

In accordance with Title 10 of the *Code of Federal Regulations* (CFR) 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, (if any), will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC's Website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Michael L. Scott, Director
Division of Reactor Projects

Docket Nos. 50-219 and 72-015
License No. DPR-16

Enclosure:
Inspection Report 05000219/2016002 and
07200015/2016001 w/Attachment:
Supplementary Information

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Letter to Mr. Bryan Hanson from Michael L. Scott, dated 2016

SUBJECT: OYSTER CREEK NUCLEAR GENERATING STATION - INTEGRATED INSPECTION REPORT 05000219/2016002 AND INDEPENDENT SPENT FUEL STORAGE INSTALLATION REPORT 07200015/2016001 AND EXERCISE OF ENFORCEMENT DISCRETION

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.	50-219 and 72-015
License No.	DPR-16
Report Nos.	05000219/2016002 and 07200015/2016001
Licensee:	Exelon Nuclear
Facility:	Oyster Creek Nuclear Generating Station
Location:	Forked River, New Jersey
Dates:	April 1, 2016 – June 30, 2016
Inspectors:	A. Patel, Senior Resident Inspector E. Andrews, Resident Inspector W. Cook, Senior Reactor Analyst B. DeBoer, Health Physicist M. Henrion, Project Engineer O. Masnyk Bailey, Health Physicist J. Richmond, Senior Reactor Inspector J. Schoppy, Senior Reactor Inspector
Approved By:	Silas R. Kennedy, Chief Reactor Projects Branch 6 Division of Reactor Projects

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SUMMARY

IR 05000219/2016002 and 07200015/2016001; 04/01/2016 – 06/30/2016; Exelon Energy Company, LLC, Oyster Creek Generating Station; Follow-Up of Events and Notices of Enforcement Discretion.

This report covered a three-month period of inspection by resident inspectors and announced baseline inspections performed by regional inspectors. One self-revealing non-cited violation (NCV) of very low safety significance (Green) was documented in this report. 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 April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

Cornerstone: Initiating Events

- Green. A self-revealing NCV of Technical Specification 6.8.1, "Procedures and Programs," was identified because Exelon did not adequately establish and maintain the reactor recirculation pump (RRP) reassembly maintenance procedures as required by NRC Regulatory Guide 1.33, Appendix A, Section 9, "Procedures for Performing Maintenance." Specifically, the RRP reassembly procedure, 2400-SMM-3226.03, "Reactor Recirculation Pump Mechanical Seal Rebuild Using CAN-2A Parts," did not provide critical dimensional checks for the locking plate and seal adjusting cap. This led to the incorrect reassembly of the 'D' RRP. Exelon entered this issue into their corrective action program as issue report 2663436. The corrective actions included repairing the 'D' RRP and revising RRP maintenance procedures to include critical dimensional information.

  This finding is more than minor because it is associated with the procedure quality attribute of the Initiating Events cornerstone and affected the objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown and power operation. Specifically, the incorrect reassembly of the 'D' RRP created a leakage path, which led to an unexpected increase in reactor coolant system (RCS) unidentified leakage. As a result, the operators inserted a manual scram on April 30, 2016. The inspectors evaluated the finding using IMC 0609, Attachment 4, "Initial Screening and Characterization of Findings," and IMC 0609, Appendix A, Exhibit 1, "Initiating Event Screening Questions." The inspectors determined that this finding is a transient initiator that did not contribute to both the likelihood of a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition, and therefore was of very low safety significance (Green). The inspectors determined that there was no cross-cutting aspect associated with this finding since it was not representative of current Exelon performance. Specifically, in accordance with IMC 0612, the causal factors associated with this finding occurred outside the nominal three-year period of consideration and were not considered representative of present performance. (Section 4OA3)

REPORT DETAILS

Summary of Plant Status

Oyster Creek began the inspection period at 100 percent power. On April 24, 2016, operators commenced a reactor shutdown and entered a planned maintenance outage (1M38) on April 25. On April 29, operators commenced a reactor startup following completion of the planned maintenance outage. On April 30, operators manually scrammed the reactor due to a rise in unidentified leak rate. Operators returned the unit to 100 percent power on May 13 following repairs on the 'D' RRP seal. On May 13, operators lowered power to 80 percent for a rod pattern adjustment and returned the unit to 100 percent power the following day. On June 4, operators lowered power to 70 percent power percent for a rod pattern adjustment and returned the unit to 100 percent power the following day. Oyster Creek remained at or near 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 – 3 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 'C' 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's 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's 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.

.3 External Flooding

a. Inspection Scope

During the week of June 6, 2016, the inspectors performed an inspection of the external flood protection measures for Oyster Creek Generating Station. The inspectors reviewed the UFSAR, Chapter 2.4.2.4, which depicted the design flood levels and protection areas containing safety-related equipment to identify areas that may be affected by external flooding. The inspectors conducted a general site walkdown of the emergency diesel generator building and intake area to ensure that Exelon erected flood protection measures in accordance with design specifications. The inspectors also reviewed operating procedures for mitigating external flooding during severe weather to determine if Exelon planned or established adequate measures to protect against external flooding events.

b. Findings

No findings were identified.

1R04 Equipment Alignment

Partial System Walkdowns (71111.04 – 3 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Emergency service water system I while emergency service water system II was out of service on April 19, 2016
- Reactor building closed cooling water system for shutdown cooling on April 26, 2016
- Core spray system II following indication of valve degradation on April 27, 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 UFSAR, technical specifications, work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted the system's performance of its intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable.

The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether Exelon staff had properly identified equipment issues and entered them into the corrective action program for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

1R05 Fire Protection

Resident Inspector Quarterly Walkdowns (71111.05Q – 5 samples)

a. Inspection Scope

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

- Reactor building 51' elevation on April 18, 2016
- Reactor building 75' elevation on April 18, 2016
- Reactor building 95' elevation on April 18, 2016
- Condenser bay on April 28, 2016
- Trunnion room on April 28, 2016

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)

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-743-1 and MH-536-1, 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 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.

1R07 Heat Sink Performance (711111.07A – 1 sample)

a. Inspection Scope

The inspectors reviewed the 1-1 reactor building closed cooling water heat exchanger readiness and availability to perform its safety functions. The inspectors reviewed the design basis for the component and verified Exelon's commitments to NRC Generic Letter 89-13, "Service Water System Requirements Affecting Safety-Related Equipment." The inspectors reviewed the cleaning and inspection of the heat exchanger, discussed the results of the most recent inspection with engineering staff, and reviewed pictures of the as-found and as-left conditions. The inspectors verified that Exelon initiated appropriate corrective actions for identified deficiencies. The inspectors also verified that the number of tubes plugged within the heat exchanger did not exceed the maximum amount allowed.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11Q – 3 samples)

.1 Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training on June 22, 2016, which included a level instrument failure and a reactor scram with an anticipated transient without a scram. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the technical specification action statements entered by the unit supervisor. 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 licensed operator performance during plant shutdown activities for a planned maintenance outage (1M38) on April 25, 2016. The inspectors also observed control room operator performance during plant startup activities from a planned maintenance outage (1M38) on May 4, 2016. The inspectors observed infrequently performed test or evolution briefings, pre-shift briefings, reactivity control 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. This paragraph represents two samples.

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.

- Feedwater heater system on April 4, 2016
- Emergency diesel generator No. 1 on June 16, 2016

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 7 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.

- Reactor building closed cooling water heat exchanger out of service for planned maintenance on April 4, 2016
- Emergency service water system I and containment spray system I out of service for planned maintenance on April 12, 2016
- Emergency service water system II and containment spray system II out of service for planned maintenance on April 18, 2016
- Yellow shutdown risk due to decay heat removal for planned maintenance outage, 1M38, on April 25, 2016
- Core spray system II out of service for planned maintenance on May 17, 2016
- Emergency diesel generator No. 1 out of service for planned maintenance on June 6, 2016
- Unplanned orange risk due to emergency diesel generator out of service for planned maintenance and severe thunderstorm warning on June 8, 2016

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 3 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 increased fluoride levels on April 22, 2016
- Core spray system II isolation valve loss of indication on April 26, 2016
- Operator workarounds on May 16, 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 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. The inspectors reviewed degraded or non-conforming equipment and program deficiencies to assess whether Exelon was appropriately identifying and managing operator workarounds, including prioritizing, tracking, and resolving those issues. Specifically, the inspectors evaluated equipment and program deficiencies to determine (1) whether a deficiency posed an operator burden or obstacle to safe plant operation during operator response to transients and emergency conditions, and (2) whether Exelon identified operator workarounds at an appropriate threshold. In addition, the inspectors assessed the operator workarounds to determine whether the measures in-place would function as intended and were properly controlled by Exelon. Specifically, the inspectors compared the operator workaround actions to equipment design functions or the intent of the impacted programs to determine whether those actions satisfied the affected design requirements, technical specifications, or program intent.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 1 sample)

Temporary Modifications

a. Inspection Scope

The inspectors reviewed the temporary modification to the emergency service water system implemented by engineering change request 15-00023, "Replace Emergency Service Water Keep Full Check Valves with Orifices," to determine whether the modifications affected the safety functions of systems that are important to safety. The inspectors reviewed 10 CFR 50.59 documentation and post-modification testing results, and conducted field walkdowns of the modifications to verify that the temporary modifications did not degrade the design bases, licensing bases, and performance capability of the affected systems.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 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 system II following relay replacement on April 19, 2016
- Main steam isolation valve following limit switch replacement on April 29, 2016
- Drywell floor drain 1-8 sump following sump replacement on May 10, 2016
- Control rod drive mechanism 18-47 following control rod drive mechanism replacement on May 11, 2016
- 'D' RRP following seal replacement on May 13, 2016
- Emergency diesel generator No. 1 following planned maintenance on June 11, 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 outage (1M38) conducted April 24 through May 13, 2016. 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
- Status and configuration of electrical systems and switchyard activities to ensure that technical specifications were met
- Monitoring of decay heat removal operations
- 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
- Fatigue management
- Tracking of startup prerequisites, walkdown of the drywell (primary containment) to verify that debris had not been left which could block the emergency core cooling system suction strainers, and startup and ascension to full power operation
- Identification and resolution of problems related to refueling outage activities

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 4 samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant structures, systems, and components to assess whether test results satisfied technical specifications, the UFSAR, and Exelon's 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:

- Isolation condenser automatic actuation sensor calibration and test on April 1, 2016
- Main steam isolation valve 'B' closure test on April 26, 2016 (isolation valve)
- Core spray system II pump operability and quarterly in-service test on May 17, 2016 (in-service test)
- Emergency diesel generator No. 1 load test on May 23, 2016

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 Oyster Creek licensed operators on June 22, 2016, 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.

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, 2015, through March 31, 2016.

- 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 Nuclear Energy Institute (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, 2015, through March 31, 2016. 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 Part 21.

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a semi-annual review of site issues to identify trends that might indicate the existence of more significant safety concerns. As part of this review, the inspectors included repetitive or closely related issues that may have been documented by Exelon outside of the corrective action program, such as trend reports, site performance indicators, major equipment problem lists, system health reports, maintenance rule assessments, and maintenance or corrective action program backlog reports. The inspectors also reviewed Exelon's corrective action program database for the past quarter to assess issue reports written in various subject areas (e.g., equipment problems, human performance issues), as well as individual issues identified during the NRC's daily issue report review. The inspectors evaluated a sample of corrective and preventive maintenance backlog items, control room deficiency tags, open operability evaluations, and operator workaround items. The inspectors observed a preventive maintenance oversight committee meeting. In addition, the inspectors performed a focused review of emergency diesel generator corrective action issues and preventive maintenance tasks to assess whether Exelon was appropriately prioritizing and resolving emergency diesel generator issues.

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 of emergency diesel generator corrective and preventive maintenance items concluded that Exelon was maintaining emergency diesel generator operability and availability at an appropriate threshold.

.3 Annual Sample: Review of Exelon Cause Determination for an Emergency Diesel Generator Failure to Start

a. Inspection Scope

The inspectors performed an in-depth review of Exelon's evaluations and corrective actions associated with issue report 02584237, which documented an emergency diesel generator failure to start due to a relay failure.

The inspectors assessed Exelon's problem identification threshold, problem analysis, extent of condition reviews, compensatory actions, and the prioritization and timeliness of corrective actions to determine whether Exelon was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of Exelon's corrective action program and 10 CFR 50 Appendix B. The inspectors interviewed engineering and operations personnel to assess the effectiveness of the implemented corrective actions, the reasonableness of the planned corrective actions, and to evaluate the extent of any on-going problems. In addition, the inspectors walked down the emergency diesel generators to independently assess material conditions.

b. Findings and Observations

No findings were identified.

On November 9, 2015, emergency diesel generator No. 1 failed to start during a routine surveillance test. During troubleshooting, Exelon identified that the zero speed relay was not de-energized or dropped-out, as expected. In the de-energized state, the zero speed relay provides a start permissive to the diesel engine control circuit to ensure that the engine is not rotating prior to attempting a subsequent engine start. The zero speed relay is an assembly comprised of two discrete components, a general purpose Vapor Corporation relay and an Artisan Controls Corporation solid state delay-on-break timing module. Exelon's subsequent apparent cause evaluation performed a failure analysis of the zero speed relay assembly which determined that the time delay module had failed in such a way as to keep the relay energized after the speed input signal had been removed.

Exelon’s failure analysis determined that the time delay module idle/off voltage had increased to a value greater than the relay coil dropout voltage, such that when the module timed out, the module's output voltage was still sufficient to maintain the relay energized. Because the time delay module was encapsulated in a hardened potting compound, Exelon was unable to determine a specific failed component within the module. The failure analysis also demonstrated that the time delay module's setpoint had not drifted, and remained at two seconds. Exelon's extent of condition corrective actions replaced all of the relays with similar time delay modules on both emergency diesel generators. The inspector concluded that Exelon's apparent cause determination was robust and thorough. Additional information on this issue is provided in section 4OA3.3.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 3 samples)

.1 Plant Events

a. Inspection Scope

On April 30, 2016, the inspectors responded to a manual scram due to an increase in unidentified leakage during reactor startup. The inspectors reviewed and observed plant parameters, reviewed personnel performance, and evaluated performance of mitigating systems. The inspectors communicated the plant events to appropriate regional personnel, and compared the event details with criteria contained in IMC 0309, "Reactive Inspection Decision Basis for Reactors," for consideration of potential reactive inspection activities. As applicable, the inspectors verified that Exelon made appropriate emergency classification assessments and properly reported the event in accordance with 10 CFR Parts 50.72 and 50.73. The inspectors reviewed Exelon follow-up actions related to the events to assure that Exelon implemented appropriate corrective actions commensurate with their safety significance.

b. Findings

Introduction. A self-revealing Green NCV of Technical Specification 6.8.1, "Procedures and Programs," was identified because Exelon did not adequately establish and maintain the RRP reassembly maintenance procedures as required by NRC Regulatory Guide 1.33, Appendix A, Section 9, "Procedures for Performing Maintenance." Specifically, the RRP reassembly procedure, 2400-SMM-3226.03, "Reactor Recirculation Pump Mechanical Seal Rebuild Using CAN-2A Parts," did not provide critical dimensional checks for the locking plate and seal adjusting cap. This resulted in the 'D' RRP being incorrectly assembled during a planned maintenance outage (1M38) and led to an unexpected increase in RCS unidentified leakage and subsequent manual reactor scram on April 30, 2016.

Description. Oyster Creek has five recirculation loops. Each loop consists of a pump, which provides forced circulation of water through the reactor core. This allows for a higher reactor core power density compared to natural circulation and allows control room operators to adjust recirculation flow to control reactor power. Each recirculation pump contains two shaft seal packages, which contain reactor water within the pump casing and allows zero leakage into containment.

Oyster Creek conducted a maintenance outage starting on April 25, 2016. A portion of the maintenance outage scope was to replace a seal package on the 'D' RRP. On April 29, 2016, upon completion of the RRP reassembly, the unit commenced reactor startup. During reactor startup on April 30, 2016, operators noticed a rise in RCS unidentified leakage. It was determined that the 'D' RRP was leaking approximately 1gpm, and operators inserted a manual scram to further investigate the cause of the leakage. At the time of the manual scram, the plant was critical at less than 1 percent of rated thermal power.

Following several attempts to repair the seal, Exelon established a complex troubleshooting action plan on May 5, 2016. Upon 'D' RRP disassembly, it was discovered that the adjusting cap was not set properly. This led to the incorrect reassembly of the 'D' RRP, which created a leakage path. Each recirculation pump seal has two locking plates that are bolted to the seal. During seal reassembly, the locking plates were incorrectly positioned.

The seal adjusting cap was then screwed on top of the locking plates per procedure 2400-SMM-3226.03, “Reactor Recirculation Pump Mechanical Seal Rebuild Using CAN-2A Parts.” Step 9.12.3 directs the mechanic to screw the adjusting cap onto the seal sleeve so it tightens against the lock plates. Dimensional checks were not included in the procedure to ensure correct installation. The incorrect installation of the seal locking plates caused the adjusting cap to be screwed on too high on the shaft sleeve, which created a leakage path.

On May 8, 2016, a new ‘D’ RRP seal was assembled with the proper dimensional measurements verified by vendor experts to ensure proper assembly and installation. The plant commenced startup on May 10, 2016, and leakage from the ‘D’ RRP was minimal.

Exelon completed a root cause evaluation under issue report 2663436 and determined that revision to maintenance procedure 2400-SMM-3226.03, “Reactor Recirculation Pump Mechanical Seal Rebuild Using CAN-2A Parts,” was not completed after a similar issue occurred in 2012 (issue report 1434685). While performing a section in 2400-SMM-3226.01, “Reactor Recirculation Pump Maintenance,” technicians discovered inadequate clearance between the ‘E’ RRP pump coupling and adjusting cap, which resulted from an improper assembly of the ‘E’ RRP. Once this issue was identified, corrective actions were not implemented to prevent similar issues from occurring.

Analysis. The failure to maintain the RRP reassembly procedure to ensure the ‘D’ RRP was correctly reassembled is a performance deficiency that was within Exelon’s ability to foresee and correct. This performance deficiency is determined to be more than minor because it is associated with the procedure quality attribute of the Initiating Events cornerstone and affected the objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown and power operation. Specifically, the incorrect reassembly of the ‘D’ RRP created a leakage path, which led to an unexpected increase in RCS unidentified leakage. As a result, the operators inserted a manual scram on April 30, 2016.

The inspectors evaluated the finding using IMC 0609, Attachment 4, “Initial Screening and Characterization of Findings,” and IMC 0609, Appendix A, Exhibit 1, “Initiating Event Screening Questions.” The inspectors determined that this finding is a transient initiator that did not contribute to both the likelihood of a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. Therefore, the inspectors determined the finding to be of very low safety significance (Green).

The inspectors determined that there was no cross-cutting aspect associated with this finding since it was not representative of current Exelon performance. Specifically, in accordance with IMC 0612, the causal factors associated with this finding occurred outside the nominal three-year period of consideration and were not considered representative of present performance. The last time Exelon had the opportunity to evaluate this issue was in 2012 when Exelon initiated describing difficulties with installation of a pump coupling after installing a new seal (issue report 1434685).

Enforcement. Technical Specification 6.8.1, “Procedures and Programs,” requires, in part, that written procedures be established, implemented, and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33 as reference in the quality assurance topical report. As referenced in NO-AA-10, “Quality Assurance Topical Report,” Exelon follows Regulatory Guide 1.33, Appendix A,

Revision 2, which requires procedures for the repair or replacement of equipment, including the replacement of recirculation pump seals. Contrary to the above, prior to April 30, 2016, Exelon did not properly establish and maintain the RRP reassembly maintenance procedure. Specifically, Exelon's RRP maintenance procedure, 2400-SMM-3226.03, did not provide critical dimensional checks for the locking plate and seal adjusting cap.

This issue was entered into the corrective action program as issue report 2663436, and Exelon's immediate corrective actions included repairing the 'D' RRP and revising RRP maintenance procedures to include critical dimensional information. Because the violation was of very low safety significance (Green) and has been entered into the corrective action program, this violation is being treated as an NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy. (NCV 05000219/2016002-01, Inadequate Maintenance Procedure associated with Reactor Recirculation Pump Seal).

.2 (Closed) LER 05000219/2016-002-00: Control Rod Drive Cooling Water System Isolation Scram Time Testing was not Performed

On March 16, 2016, the NRC inspectors identified that scram time testing had not been performed following the isolation of cooling water flow to control rod 18-47 and 42-27. The isolation of cooling water flow to a control rod can impact scram times. Technical Specification, 4.2.C.2 states in part, "for specifically affected individual control rods following maintenance on or modification to the control rod or control rod drive system which could affect the scram insertion time of those specific control rods shall be scram time tested." Since the testing was not performed, Technical Specification 4.0.1 was applicable as a surveillance requirement that was not met. In accordance with Technical Specification 4.0.1, if the surveillance requirement was not met, this would require entry into the appropriate limiting condition for operation for Technical Specification 3.2.B.4, which would have required the control rods be declared inoperable, fully inserted, and isolated. Additionally, Technical Specifications 3.2.A.2 and 3.2.A.3 would also be applicable which required a determination that adequate shutdown margin would be maintained within six hours of declaring the control rods inoperable. Since these technical specifications actions were not completed, this resulted in an operation or condition that was prohibited by technical specifications. The enforcement aspects of this issue are discussed in Inspection Report 05000219/2016001 and 05000219/2016009 (ML16132A436), section 1R15. The inspectors did not identify any new issues during the review of the LER. This LER is closed.

.3 (Closed) LER 05000219/2015-003: Failure of the #1 Emergency Diesel Generator to Start During Surveillance Testing

Description and Analysis: On November 9, 2015, emergency diesel generator No. 1 failed to start during a routine surveillance test, due to a failed zero speed relay. Laboratory analysis of the zero speed relay assembly determined that the time delay module had failed in such a way as to keep the relay energized after the speed input signal had been removed. Exelon's apparent cause determination concluded that the zero speed relay had failed to de-energize and drop-out when the emergency diesel generator was shutdown at the end of the previous diesel surveillance run performed on October 26, 2015. The zero speed relay was replaced and emergency diesel generator No. 1 returned to service on November 10, 2015. Aspects of this event were previously reviewed and documented in NRC Inspection Report 05000219/2015004 (ML16028A061).

The inspectors determined that the relay failure was not within Exelon's ability to reasonably foresee and prevent. As a result, no performance deficiency was identified. The inspector's assessment considered:

1. Exelon's review of emergency diesel generator maintenance, performed in 2013, identified this relay as a single point vulnerability, classified it as a critical component, and verified that the plant specific maintenance tasks adequately implemented industry operating experience and vendor recommendations. The inspector did not identify any gaps or deficiencies in Exelon's 2013 evaluations.

2. At the time of failure, the relay in-service time of 19 years was less than the time directed replacement frequency of 20-years recommended by the emergency diesel generator owners group. The inspector did not identify any additional vendor or industry recommendations or considerations specific to the failed component.

3. The laboratory analysis demonstrated that the relay's time delay module continued to change state with a two second time delay, but had developed an excessive leakage current. Therefore, the inspector concluded that the relay failure mechanism would not be reasonably detected by a condition monitoring task, such as a time delay relay setpoint verification activity.

4. Industry operating experience information available to Exelon did not identify the potential for the relay problem that was experienced.

5. The relay failure was not the result of improper action or inaction taken by Exelon staff (e.g., not the result of an oversight or human error).

Exelon evaluated this issue using Oyster Creek's internal events and fire probabilistic risk assessment (PRA) models. Exelon's evaluation of the risk significance of this issue determined that the total (internal and external events risk) increase in core damage frequency (CDF) was in the mid E-6 range, or a low to moderate safety significance (White). A Region I senior reactor analyst (SRA) reviewed Exelon's risk evaluation and independently confirmed the estimated increase in CDF due to the emergency diesel generator unavailability. Using the Oyster Creek Standardized Plant Analysis Risk model, Version 8.22, and Systems Analysis Programs for Hands-On Integrated Reliability Evaluations Version 8.1.3, the SRA evaluated the internal events risk contribution due to the inoperability of emergency diesel generator No. 1 for 15 days (i.e., exposure time of 14 days plus 0.75 day for repair, rounded-up to 15 days). The internal events contribution was estimated at 1.1E-6/year increase in CDF. The dominant sequences involved loss of off-site power events with a concurrent failure of emergency diesel generator No. 2 and failure of operators to recover off-site power or recover an emergency diesel generator prior to core damage. To estimate the external risk contribution, the SRA identified that the most significant external risk contribution was from fire events. Seismic, external flooding, and high wind events were not significant contributors for this issue. Using Exelon's Oyster Creek fire PRA results, the increase in CDF due to the failed emergency diesel generator No. 1 was estimated at 3.5E-6/year [(1.3E-4/year – 4.5E-5/year) x (15/365)]. The dominant fire sequences involved catastrophic start-up transformer and 4 kilovolt switchgear fires with subsequent failure of make-up to the isolation condensers leading to core damage. Combining internal and external events risk contributions, the total increase in CDF due to this failure of emergency diesel generator No. 1 was 4.6E-6/year, or low to moderate safety

significance (White). The SRA review of the dominant accident sequences and associated time to core damage affirmed that the risk was dependent upon CDF vice large early release frequency.

Enforcement: Oyster Creek Technical Specification 3.7.C.2, in part, states that if one diesel generator becomes inoperable during power operation, the reactor may remain in operation for a period not to exceed 7 days. Contrary to the above, between October 26, 2015, and November 10, 2015 (a period greater than 7 days), one diesel generator became inoperable during power operation, and Oyster Creek remained in operation. Specifically, on November 9, 2015, emergency diesel generator No. 1 failed to start during a routine surveillance test due to a failed zero speed relay. Exelon subsequently determined that the emergency diesel generator would have been unable to start since the last time the emergency diesel generator had been run and shutdown, on October 26, 2015. Exelon completed repairs and returned the emergency diesel generator to service on November 10, 2015. Exelon entered this violation into their corrective action program as issue report 02584237.

The NRC determined that it was not reasonable for Exelon to have been able to foresee and prevent this violation of NRC requirements, and as such, no performance deficiency existed. Therefore, the NRC has decided to exercise enforcement discretion in accordance with Sections 2.2.4 and 3.5 of the NRC Enforcement Policy and refrain from issuing enforcement action for the violation of technical specifications (EA-16-102). Further, because Exelon's actions did not contribute to this violation, it will not be considered in the assessment process or the NRC Action Matrix. The inspector did not identify any new issues during the review of the LER. This LER is closed.

.4 (Closed) LER 05000219/2016-003-00: Manual Scram Inserted due to Leakage from the 'D' Reactor Recirculation Pump Seal

On April 30, 2016, during a plant startup from a planned maintenance outage (1M38), the station identified a rise in unidentified leak rate from 0.21 gallons to 1.62 gallons. Inspections in the drywell were performed to troubleshoot the cause in the rise of the unidentified leak rate. Through those inspections, it was determined that the 'D' RRP shaft was leaking. Control room operators initiated a manual scram of the reactor to place the plant in a safe condition due to the leakage from the 'D' RRP. Following the manual scram, all systems operated as expected.

Exelon performed a root cause analysis on the event and determined that the seal rebuild procedure was not properly revised in 2012 to prevent this failure from occurring. The enforcement aspects of this issue are discussed in section 4OA3.1. The inspectors did not identify any new issues during the review of the LER. This LER is closed.

4OA5 Other Activities

Operation of an ISFSI at Operating Plants (Inspection Procedures 60855 and 60855.1)

a. Inspection Scope

From May 16-19, 2016, the inspectors observed and evaluated Oyster Creek's loading of dry storage cask (DSC)-26, the third canister to be loaded during their Independent Spent Fuel Storage Installation (ISFSI) dry cask campaign. The inspectors reviewed Oyster Creek's activities associated with the loading of DSC-26.

The inspectors also reviewed Oyster Creek's activities related to long-term operation and monitoring of the ISFSI. The inspectors verified compliance with the Certificate of Compliance, ISFSI technical specifications, regulations, and station procedures. The inspectors observed the heavy load movement of the transfer cask and the loaded DSC from the spent fuel pool to the cask processing area. The inspectors also observed DSC processing operations including: installation of the DSC inner top cover, removal of the annulus seal, installation of the automated welding system, welding, non-destructive weld examinations, draining, vacuum drying, helium backfill, surveying, and decontamination. During performance of these activities, the inspectors verified that procedure use, communication, and coordination of ISFSI activities met Oyster Creek's established standards and requirements.

The inspectors reviewed Oyster Creek's program associated with fuel characterization and selection for storage. The inspectors reviewed the fuel selection package for the third cask loaded during the current campaign, including alternate fuel assemblies, to verify that Oyster Creek was loading fuel in accordance with the Certificate of Compliance, ISFSI technical specifications, and procedures. The inspectors reviewed recordings made of the fuel assemblies loaded into the third cask, DSC-26, to ensure the loading was in accordance with Oyster Creek's loading plan.

The inspectors observed radiation protection technicians as they provided job coverage for the cask loading workers. The inspectors reviewed survey data maps and radiological records from the DSC loading to confirm that radiation survey levels measured were within limits specified by the technical specifications and consistent with values specified in the final safety analysis report.

The inspectors performed a walk-down of the heavy haul path and toured the ISFSI pad to assess the material condition of the pad and the horizontal storage modules. The inspectors also verified that transient combustibles were not being stored on the haul path, ISFSI pad or in the vicinity of the horizontal storage modules. The inspectors also confirmed that transient combustible material entry onto the ISFSI pad was controlled in accordance with procedures.

The inspectors reviewed corrective action reports and the associated follow-up actions that were generated since Oyster Creek's last loading campaign to ensure that issues were entered into the corrective action program, prioritized, and evaluated commensurate with their safety significance.

b. Findings

No findings of safety significance were identified.

4OA6 Meetings, Including Exit

On July 6, 2016, the inspectors presented the inspection results to Mr. 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
A. Bready, Probability Risk Assessment Engineer
T. Cappuccino, Senior Regulatory Assurance Specialist
D. Chernesky, Director, Maintenance
J. Clark, Senior Manager, Plant Engineering
B. Dennis, AREVA Shift Supervisor
D. DiCello, Director, Work Management
L. Dormann, Electrical Design Engineer
J. Dougherty, Site DCS Program Manager
R. Dutes, Regulatory Assurance Specialist
M. Ford, Director, Operations
R. Francis, System Manager
M. George, Reactor Services and Fuel Handling Supervisor
T. Keenan, Manager, Site Security
M. McKenna, Manager, Regulatory Assurance
K. Murphy, Radiation Protection Manager
H. Ray, Senior Manager, Design Engineering
J. Renda, Manager, Environmental/Chemistry
C. Ricketts, Electrical Systems Manager
J. Stanley, Director, Engineering
C. Symonds, Director, Training
E. Swain, Shift Operations Superintendent
H. Tritt, Electrical Design Engineering Manager
K. Wolf, Radiation Protection Manager

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened/Closed

05000219/2016002-01	NCV	Inadequate Maintenance Procedure associated with Reactor Recirculation Pump Seal (Section 4AO3.1)

Closed

05000219/2016-002-00	LER	Control Rod Drive Cooling Water System Isolation Scram Time Testing was not Performed (Section 4OA3.2)
05000219/2015-003-00	LER	Failure of the #1 Emergency Diesel Generator to Start During Surveillance Testing (Section 4OA3.3)
05000219/2016-003-00	LER	Manual Scram Inserted due to Leakage from the ‘D’ Reactor Recirculation Pump Seal (Section 4OA3.4)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures
ABN 60, Grid Emergency, Revision 18
328, Turbine Building Heating and Ventilation System, Revision 61
328.1, Battery Room "C" HVAC, Revision 21
341, Emergency Diesel Generator Operation, Revision 111
EN-OC-402-0005, Extreme Heat Implementation Plan, Revision 0
OP-OC-108-109-1001, Severe Weather Preparation T&RM for Oyster Creek, Revision 33
OP-AA-108-111-1001, Severe Weather and Natural Disaster Guidelines, Revision 14

Condition Reports

2514925	2665807	2624487
2634886	2658052	2682675

Work Orders

C2035444	C2034888	R2115895
C2034589	R2260210	R2268481

Miscellaneous
2016 Certification of Oyster Creek Generating Station Summer Readiness, dated May 15, 2016

Section 1R04: Equipment Alignment

Procedures
310, Containment Spray System Operation, Revision 113
305, Shutdown Cooling System Operation, Revision 121
309.2, Reactor Building Closed Cooling Water, Revision 95
308, Emergency Core Cooling System Operation, Revision 96

Condition Reports

1627787	2390039	2488501
1687273	2391033	
1688085	2470660	

Drawings
GE 885D781, Core Spray System Flow Diagram, Sheet 1, Revision 76

Miscellaneous
Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report,
Section 9.2, Reactor Building Closed Cooling Water, Revision 18

Section 1R05: Fire Protection

Procedures
ER-AA-600-1069, High Risk Fire Area Identification, Revision 1
OP-OC-201-008-1002, Reactor Building (95' Elevation), Revision 1
OP-OC-201-008-1003, Reactor Building (75' Elevation), Revision 1
OP-OC-201-008-1004, Reactor Building (51' Elevation), Revision 2
OP-OC-201-008-1030, Condenser Bay Area (3'-6" Elevation); Trunnion Room (23'6" Elevation), Revision 0
FSP-TB11E, Fire Support Procedure for Condenser Bay, Revision 8
OP-OC-102-106, Operator Response Time Program at Oyster Creek, Revision 0

Condition Reports
2658040

Section 1R06: Flood Protection Measures

Procedures
ER-AA-300-150, Cable Condition Monitoring Program, Revision 3
MA-OC-773-001, Testing/Condition Monitoring of Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification, Revision 2

Drawings
3179, Miscellaneous Outdoor Facilities, Revision. 9
D-79228, Station Blackout Underground Duct Plan, Revision 2
ECR 11-00474 Attachment 4 Sheet. 6-11, Flygt Level Monitoring & Dewatering System, Revision 0

Condition Reports
02671067

Work Orders
R2239495
R2242383
R2244933
R2259235

Miscellaneous
AR 00330592-36, Inaccessible Medium Voltage Cable Aging Management Program, dated April 9, 2009
CableWise Test Report 2012-214, dated September 20, 2012
ESW 1-4 HVA Tan Delta Test Report, dated February 26, 2013
FHRR-OYS-001, Flood Hazard Reevaluation Report, Revision 1
Technical Evaluation 02671067-04, Acceptability of CableWise Cable Test Data, dated May 26, 2016

Section 1R07: Heat Sink Performance

Procedures
ER-OC-340-1001, Oyster Creek Generic Letter 89-13 Program Basis Document, Revision 4
309.2, Reactor Building Closed Cooling Water System, Revision 95

Condition Reports
2470660
2497072
2637782
2638583

Work Orders
R2257032

Miscellaneous
VM-OC-0354, Installation, Operation, and Maintenance for the Reactor Building Closed Cooling Water Heat Exchanger, Revision 3

Section 1R11: Licensed Operator Requalification Program

Procedures
201, Plant Startup, Revision 101
203, Plant Shutdown, Revision 88
203.4, Plant Cooldown Following Reactor Scram, Revision 55
205.0, Reactor Refueling, Revision 80
311, Fuel Pool Cooling System, Revision 116
312.9, Primary Containment Control, Revision 62
233, Drywell Access and Control, Revision 73
ABN 1, Reactor Scram, Revision 13

Miscellaneous
Oyster Creek Generating Station Technical Specifications Section 3.2, Reactivity Control, Amendment 178
Oyster Creek Generating Station Technical Specifications Section 3.3, Reactor Coolant, Amendment 269
Oyster Creek Generating Station Technical Specifications Section 3.5, Containment, Amendment 168
Oyster Creek Station Licensed Operator Requal Training Simulator Exercise Guide, 2010-79, 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 13 317.1, Feedwater Heaters, Revision 45
ABN 17, Feedwater System Abnormal Conditions, Revision 19, 341, Emergency Diesel Generator Operation, Revision 112

Condition Reports

2565300	2596775	2611437
2498192	2616773	2611439
2477965	2616629	2611441
2432837	2616633	2611442
2542813	2609397	2611443
2538555	2609404	
2415620	2611434	

Miscellaneous
Oyster Creek Maintenance Rule Database, dated April 1, 2016
Adverse Condition Monitoring and Contingency Plan for 1C3 HP Feed Water Heater Tube Leak, Revision 3
OYS-0-2016-0085, 1 ODM: C HPFW Heater Tube Leak, Revision 0
Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report, Section 10.2, Turbine Generator, Revision 18
Oyster Creek EDG System Health Reports, Q1-201674

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
ER-AA-310, Implementation of Maintenance Rule, Revision 9
ER-AA-310-1002, Maintenance Rule Functions – Safety Significant Classifications, Revision 0
ER-AA-600, Risk Management, Revision 7
ER-AA-600-1041, Risk Metrics – SDP and Event Analysis, Revision 0
ER-AA-600-1042, Online Risk Management, Revision 9
ER-AA-600-1047, MSPI Basis Document, Revision 10
MA-OC-741, Diesel Generator Inspection (24 Month) – Electrical, Revision 0
MA-OC-741-102, EDG 1 24 Month Inspection – SU and T and Operation, Revision 0
MA-OC-861-100, Diesel Generator Planning Guidance, Revision 2
MA-OC-861-101, Diesel Generator Inspection (24 Month) – Mechanical, Revision 0
309.2, Reactor Building Closed Cooling Water System, Revision 95
322, Service Water System, Revision 90
305, Shutdown Cooling System Operation, Revision 121
310, Containment Spray System Operation, Revision 113
308, Emergency Core Cooling System Operation, Revision 96
610.3.106, Core Spray System 2 Isolation valve Actuation Test and Calibration, Revision 6
610.4.022, Core Spray System 2 Pump Operability and Quarterly In-Service Test, Revision 29

Condition Reports

2678812	2678914	2678084
2678875	2678815	2678426
2678874	2678807	

Miscellaneous
Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report, Section 9.2, Water Systems, Revision 18
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 6.2, Containment Systems, Revision 18
Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report, Section 8.3, Onsite Power Systems, Revision 18
Oyster Creek Nuclear Generating Station Technical Specifications, Section 3.7, Auxiliary Electrical Power, Amendment 256
Oyster Creek Generating Station 1M38 Maintenance Outage Shutdown Safety Plan, Revision 1

Section 1R15: Operability Determinations and Functionality Assessments

Procedures
341, Emergency Diesel Generator Operation, Revision 111
CY-AA-120-400, Closed Cooling Water Chemistry, Revision 17
CY-AA-120-4000, Closed Cooling Water Chemistry Strategic Plan, Revision 6
OP-AA-102-103, Operator Work-Around Program, Revision. 4
OP-AA-102-103-1001, Operator Burden and Plant Significant Decisions Impact Assessment Program, Revision 6
OP-AA-108-105-1001, MCR Equipment Deficiency Management Screening, Revision 5
308, Emergency Core Cooling System Operation, Revision 96
610.4.008, Core Spray Testable Check Valve Operability Test, Revision 15

Condition Reports
2644342
2598933
2661141
2388111
2388999
1442341
1442346

Drawings
3E-861-21-1001, Emergency Diesel Generator Water Cooling System, Revision 12
GE 885D781, Core Spray System Flow Diagram, Sheet 1, Revision 76

Work Orders
M2402969

Miscellaneous
Oyster Creek Nuclear Generating Station Technical Specifications, Section 3.7, Auxiliary Electrical Power, Amendment 256
Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report, Section 8.3, Onsite Power Systems, Revision 18
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
VM-OC-0095, Operating Manual – MU20E Power Plants Diesel Generators, Revision 14
Compensatory Action List on RO Turnover Report, Dayshift, dated May 17, 2016
Control Room Degraded Components (Distractions) Database, dated May 19, 2016
Disabled Alarms Database, dated May 19, 2016
Main Control Room Deficiencies Database, dated May 13, 2016
OC-2014-OE-0005, Degraded Boraflex Fuel Rack Operability, Revision 1
Operator Burden & Degraded Equipment Aggregate Assessment, dated February 4, 2016
Operator Challenges Database, dated May 19, 2016
Operator Work Arounds Database, dated May 19, 2016
Plant Health Committee Report, Operator Work Arounds & Operator Challenges, dated December 9, 2014
Plant Health Committee Report, Operator Work Arounds & Operator Challenges, dated March 3, 2015
Plant Health Committee Report, Operator Work Arounds & Operator Challenges, dated September 8, 2015
Plant Health Committee Report, Operator Work Arounds & Operator Challenges, dated January 26, 2016

Section 1R18: Plant Modifications

Procedures
310, Containment Spray System Operation, Revision 113

Condition Reports
2437988
2437653
2484130
2524505
2671183

Calculations
C-1502-532-E540-036, ESW System Design Basis, Revisions 2 and 3
C-1302-241-E540-096, OCNGS Containment Spray System Hydraulic Models, Revision 3
C-1302-532-E310-057, OC Piping Analysis for Emergency Service Water (ESW) Keepfill Line (SW-1 & SW-2), Revision 0
EXOC005-CALC-002, Design Basis for Containment Spray TDH, Revision 2

Drawings
GE148F740, Containment Spray System Flow Diagram, Sheet 1, Revision 44
BR 2005, Emergency Service Water System Flow Diagram, Sheet 4, Revision 88

Miscellaneous
ECR 15-000-23, Replace ESW Keep Full Check Valves with Orifices, Revision 6
ECR 09-00731, Update ESW Keepfill Piping Calc for Valve Replacements, Revision 0
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 1R19: Post-Maintenance Testing

Procedures
310, Containment Spray System Operation, Revision 113
318, Main Steam System and Reheat System, Revision 75
2400-SME-3411.06, MSIV Limit Switch Adjustment, Revision 6
602.4.002, MSIV Closure and IST Test, Revision 41
302.1, Control Rod Drive System, Revision 116
301.2, Reactor Recirculation System, Revision 9
RAP-RB1C(1-8), 1-8 Sump Drywell Floor Drain Sump High Level, Revision 0
RAP-RB1C(2-8), 1-8 Sump Drywell Floor Drain Sump Low Level, Revision 0
HU-AA-1211, Pre-Job Briefings, Revision 4
WC-AA-111, Surveillance Program Requirements, Revision 5
636.4.003, Diesel Generator #1 Load Test, Revision 104
MA-AA-716-012, Post Maintenance Testing, Revision 20
MA-AA-716-230-1001, Oil Analysis Interpretation Guideline, Revision 19
MA-OC-861-101, Diesel Generator Inspection (24 Month) – Mechanical, Revision 22

Condition Reports

2658157	2678960	2678815
2657137	2678914	2678914
2657180	2678875	2678875
2657018	2678874	2678874
2663673	2678872	2679099
2678875	2678426	2680352
2679398	2678084	
2679012	2678017	

Work Orders

R2117797	R2212087	A2398975
R2233393	R2211573	R2201980
C2032249	C2035840	C2035612
R2179284	A2399906	C2035703
C2027069	A2399907	
R2196074	A2398976	

Miscellaneous

Oyster Creek Generating Station Technical Specifications Section 3.5, Containment, Amendment 168
Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report, Section 6.2, Containment Systems, Revision 18
Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report, Section 8.3, Onsite Power Systems, Revision 18
SDBD-OC-740, Design Basis Document for Emergency Power System, Revision 1

Section 1R20: Refueling and Other Outage Activities

Procedures

201, Plant Startup, Revision 101
203, Plant Shutdown, Revision 88
203.4, Plant Cooldown Following Reactor Scram, Revision 55
205.0, Reactor Refueling, Revision 80
311, Fuel Pool Cooling System, Revision 116
312.9, Primary Containment Control, Revision 62
233, Drywell Access and Control, Revision 73
401.2, Nuclear Instrumentation SRM Channels Operation During Startup, Revision 16
2400-SMM-3226.01, Reactor Recirculation Pump Maintenance, Revision 19
ABN 1, Reactor Scram, Revision 13
OP-AB-300-1005, BWR Reactivity Management – Shutdown Activities, Revision 6
OP-AA-108-108, Unit Restart Review, Revision 18

Condition Reports

2668418	2663338	2662051	2666751
2666623	2665062	2662156	2665550
2666618	2661188	2662595	2665548
2665658	2661387	2662642	2664574
2665780	2661183	2662668	2663990
2665851	2661150	2662490	2663930
2663736	2661391	2666650	2663960
2665548	2661383	2661561	3663500
2663673	2662545	2666086	2663472

Work Orders
C2036154

Section 1R22: Surveillance Testing

Procedures
609.3.003, Isolation Condenser Automatic Actuation Sensor Calibration and Test, Revision 55
602.4.002, MSIV Closure and IST Test, Revision 41
610.4.022, Core Spray System 2 Pump Operability and Quarterly In-Service Test, Revision 29
636.4.003, Diesel Generator #1 Load Test, Revision 103

Calculations
4283-12-11, RE03/RE15 Analog Loop Performance, Revision 5
C-1302-411-5360-039, Oyster Creek MSIV Force Calculation, Revision 0

Condition Reports
2661337

Work Orders
R2254862
R2274728

Section 1EP6: Drill Evaluation

Procedures
EP-AA-112-100, Control Room Operations, Revision 13
EP-AA-112-100-F-01, Shift Emergency Director Checklist, Revision U
EP-AA-112-100-F-06, ERO Notification or Augmentation, Revision Q

Section 4OA1: Performance Indicator Verification

Procedures
ABN 1, Reactor Scram, Revision 13

Condition Reports
2607966
2634797

Miscellaneous
NUREG 1022, Reporting Requirements, Revision 3
NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 7
Various Operator Logs from April 1, 2015 to March 31, 2016
Performance Indicator Summary Report, dated April 2016

Section 4OA2: Problem Identification and Resolution

Procedures
MA-MA-716-010-1002, Equipment Deficiency Tag Initiation and Processing, Revision 4
OP-AA-108-105, Equipment Deficiency Identification and Documentation, Revision 11

Condition Reports

1695955	2616633	2658630
2158943	2584237	
2616629	1472947	

Drawings

EM-8393039, Sht. 3, EDG #1 Electrical Elementary Diagram, Revision 13

Work Orders

C2035631
C2035879
C2035893
R2202835

Miscellaneous

Outage Critical PM Deferral List, dated May 17, 2016
Oyster Creek Performance Indicator Detail Report, dated May 15, 2016
PM Oversight Committee Agenda, dated May 18, 2016
System Heal Reports, Various Systems, 1st Quarter 2016
OC-SDP-003, Significance Determination for EDG-1 Failure to Start on 11/9/15 due to Failure of the Zero Speed Relay, Revision 0
OYS-25105, PowerLabs Failure Analysis of a Relay / Rectifier Stack, dated 12/1/15
OC-CCD-328383-002, EDG Relay Replacement & Upgrade, Revision 0
VM-OC-0095, Operating Manual MU20E Diesel Generators, Revision 13
VM-OC-2651, Vapor Relays & Contactors, Revision 1
Licensee Event Report 50-219/2015-003-00, Failure of the #1 Emergency Diesel Generator Start during Surveillance Testing, Revision 0
ESI-EMD Owners Group Recommended Maintenance Program - Electrical for EDGs, Revision 5
Exelon PM Template for Relays - Control & Timing, Revision 1
Exelon PM Template for Electro-Motive Division Diesel Generator, Revision 12
NUREG/CR-5500, Vol. 5, Reliability Study - Emergency Diesel Generator Power System, 1987-1993, dated 2/96

Section 4OA3: Follow-up of Events and Notices of Enforcement Discretion

Procedures

ABN 1, Reactor Scram, Revision 13
OP-AA-108-108, Unit Restart Review, Revision 18
OP-AA-108-114, Post Transient Review, Revision 12
OP-AA-106-101, Significant Event Reporting, Revision 19
OP-AB-300-1005, BWR Reactivity Management – Shutdown Activities
LS-AA-1110, Reportable Event SAF 1.8, Revision 23
203.4, Plant Cooldown Following Reactor Scram, Revision 55
301.2, Reactor Recirculation System, Revision 90
233, Drywell Access and Control, Revision 73
2400-SMM-3226.01, Reactor Recirculation Pump Maintenance, Revision 19
2400-SMM-3226.03, Reactor Recirculation Pump Mechanical Seal Rebuild Using CAN-2A Parts, Revision 13

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2663413	2663436	2665550
2663338	2678195	2665548
2663469	1434685	2663141
2663475	0684028	2663293
2663436	2480855	2671144
2663415	2663990	2671564

Work Orders

R2028104 R2179284 R2027626

Section 4OA5: Other Activities

Procedures

2400-SMM-3891-04, Operation of the Reactor Building Overhead Crane, Revision 21
614.1.003, Independent Spent Fuel Storage Installation Technical Specification Surveillance Testing, Revision 3
MA-AA-716-008-1008, Reactor Services Refuel Floor FME Plan, Revision 11
OU-OC-630, ISFSI Pad and Component Annual Inspection, Revision 0
OU-OC-641, Transport and Loading of Transfer Cask and Dry Shielded Canister, Revision 4
OU-OC-642, 61BTH Dry Shielded Canister Welding, Vacuum Drying, and Helium Fill, Revision 5
OU-OC-643, Transport of Loaded Transfer Cask and Dry Shielded Canister to SPMT, to ISFSI, and Alignment/Insertion into the Horizontal Storage Module, Revision 3
NF-AA-622, Fuel Selection and Documentation for Dry Cask Loading, Revision 2
NF-OC-300-1002, Special Nuclear Material Control – Oyster Creek, Revision 20
SPM 9.2, AREVA TN Americas Services Program Manual NUHOMS 61BTH Type 1 or Type 2 DSC Closure Procedure, Revision 6

Calculations

C-1302-915-E620-022, Fuel Selection Packages OYC-0024 to OYC-0028 for DSCs OCG61B-024-C to OCG61B-028-C-ISFSI, Revision 0

Condition Reports

1333511	2411373	2556811
1420295	2556803	2641219
1624372	2556810	1363007
2500153	2622108	1624292
2556807	1347055	2452847
2589052	1465211	2556806
1338783	2440422	2562493
1422288	2556805	2658614

Miscellaneous

Areva TN Americas SPM 9.1b Welder Performance Qualifications
Hot Work Permit C2035675 12 002, Weld DSC Inner/Outer Lids
Independent Spent Fuel Storage Installation (ISFSI) Technical Specification Surveillance LS-AA-108, R2, ATT2 OCGS 72.212 Evaluation
Testing DSC #26 614.1.003
Technical Evaluation 02630899-02
Welding Procedure Specifications (WPS) Form SPM 9.1a-1, Revision 2
Welding Procedure Specifications (WPS) Form SPM 9.2-1, Revision 5
Welding Procedure Specifications (WPS) Form SPM 9.2-2, Revision 5
Work Order C2035675, 2016 ISFSI Campaign #26, DSC Loading and Storage
Work Order R2244636, RX Building 105 Ton/110 Ton Crane Yearly

LIST OF ACRONYMS

AC	alternating current
CDF	core damage frequency
CFR	*Code of Federal Regulations*
DSC	dry storage cask
ISFSI	Independent Spent Fuel Storage Installation
IMC	Inspection Manual Chapter
LER	licensee event report
NCV	non-cited violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
PRA	probabilistic risk assessment
RCS	reactor coolant system
RRP	reactor recirculation pump
SRA	senior reactor analyst
UFSAR	Updated Final Safety Analysis Report