UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

January 27, 2009

Mr. Charles G. Pardee
Senior Vice President, Exelon Generation Company, LLC
President and Chief Nuclear Officer (CNO), Exelon Nuclear
4300 Winfield Rd.
Warrenville, IL 60555

SUBJECT: OYSTER CREEK GENERATING STATION - NRC INTEGRATED INSPECTION REPORT 05000219/2008005

Dear Mr. Pardee:

On December 31, 2008, the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at your Oyster Creek Generating Station. The enclosed integrated inspection report documents the inspection findings, which were discussed on January 23, 2009, with Mr. P. Orphanos, Plant Manager, and other members of your staff.

The inspection 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 report documents one NRC-identified finding and one self revealing finding of very low safety significance (Green). Both of these findings were determined to involve violations of NRC requirements. Additionally, one licensee-identified violation which was determined to be of very low safety significance is listed in this report. However, because of the very low safety significance and because they were entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs) consistent with Section VI.A of the NRC's Enforcement Policy. If you contest these NCVs, 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 Inspectors at Oyster Creek.

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We appreciate your cooperation. Please contact me at (610) 337-5200 if you have any questions regarding this letter.

Sincerely,

/RA/

Ronald R. Bellamy, Ph.D., Chief
Projects Branch 6
Division of Reactor Projects

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

Enclosure: Inspection Report 05000219/2008005
w/Attachment: Supplemental Information

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Sincerely,
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Docket No. 50-219
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U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.:	50-219
License No.:	DPR-16
Report No.:	05000219/2008005
Licensee:	Exelon Generating Company, LLC
Facility:	Oyster Creek Generating Station
Location:	Forked River, New Jersey
Dates:	October 1, 2008 – December 31, 2008
Inspectors:	M. Ferdas, Senior Resident Inspector S. Pindale, Senior Resident Inspector (Acting) J. Kulp, Senior Resident Inspector (Acting) T. Setzer, Resident Inspector (Acting) P. Kaufman, Senior Reactor Inspector N. Perry, Senior Project Engineer C. Crisden, Reactor Inspector R. Nimitz, Senior Health Physicist
Approved By:	Ronald R. Bellamy, Ph.D., Chief Projects Branch 6 Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000219/2008005; 10/01/08 - 12/31/2008; Exelon Nuclear, Oyster Creek Generating Station; Maintenance Effectiveness, Refueling and Other Outages.

The report covered a 3-month period of inspection by resident inspectors, a project engineer, regional reactor inspectors, and an announced inspection by a regional reactor inspector and a senior health physicist. Two Green non-cited violations (NCV) were identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Initiating Events

Green. A self-revealing non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," occurred when Exelon did not perform an adequate self-check and did not properly use test equipment during 480 VAC breaker maintenance on November 7. Specifically, during the maintenance, a human performance error occurred causing a phase to phase fault and an arc flash, and resulted in the loss of safety related equipment and an automatic halon system actuation in the 480 VAC room. In response, Exelon entered this issue into the corrective action program and implemented actions to address work practice deficiencies.

The finding is more than minor because it is associated with the human performance attribute of the initiating events cornerstone and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Using Appendix G, "Shutdown Operations Significance Determination Process," of Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance (Green) because it did not increase the likelihood of a loss of reactor coolant system (RCS) inventory, did not affect the licensee's ability to terminate a leak path or add inventory to the RCS, or degrade the licensee's ability to recover decay heat removal in the event it was lost. The performance deficiency had a cross-cutting aspect in the area of human performance because Exelon did not properly implement human error prevention techniques, such as self and peer checking [H.2(c)]. (Section 1R12)

Cornerstone: Barrier Integrity

Green. The inspectors identified an NCV of Technical Specification 3.9.D "Refueling", when Exelon performed core alterations without the required configuration of operable source range monitors (SRM). Specifically, Exelon installed two fuel assemblies in a reactor quadrant when the required configuration of SRMs was not operable. In response, Exelon entered this issue into the corrective action program and implemented actions to revise the reactor refueling procedure.

The finding is more than minor because it is associated with the configuration control attribute of the barrier integrity cornerstone and affected the cornerstone objective of providing reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, during a time of decreased availability of physical barriers (refueling outage), Exelon performed core alterations without the required configuration of operable SRMs. Using Appendix G, "Shutdown Operations Significance Determination Process," of Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance (Green) because it did not increase the likelihood of a loss of reactor coolant system (RCS) inventory, did not affect the licensee's ability to terminate a leak path or add inventory to the RCS, or degrade the licensee's ability to recover decay heat removal in the event it was lost. The performance deficiency had a cross-cutting aspect in the area of human performance, because Exelon did not ensure that the reactor refueling procedures accurately implemented the neutron monitoring requirements contained in the Technical Specifications [H.2(c)]. (Section 1R20)

B. Licensee-Identified Violations

A violation of very low safety significance, which was identified by Exelon, has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the Exelon's corrective action program. This violation and corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

At the time of the inspection, AmerGen Energy Company, LLC was the licensee for Oyster Creek Generating Station. As of January 8, 2009, the Oyster Creek license was transferred to Exelon Generating Company, LLC (Exelon) by license amendment No. 271 (ML083640373).

The Oyster Creek Generating Station (Oyster Creek) began the inspection period operating at 98% power due to end-of cycle operations.

On October 6, operators reduced power to 93% and removed the intermediate pressure feedwater heaters from service to support end-of-cycle operations. Operators returned the plant to full (100%) power on October 7, 2008.

On October 18, operators performed an unplanned downpower to 65% to repair a leaking drain line on the 'C' feedwater regulating valve. Operators returned the plant to full power on October 19, 2008.

On October 24, operators commenced a planned shutdown to begin the 1R22 refueling outage. The main turbine was removed from service and the reactor was shutdown on October 25, 2008. Oyster Creek was placed in cold shutdown on October 27, 2008.

On November 17, operators commenced a reactor startup following the refueling outage and declared the reactor critical. Operators synchronized the main turbine generator to the grid on November 18, 2008. The plant reached and was limited to 98.5% power on November 22, 2008 due to a failed feedwater temperature sensing element.

On November 22, operators performed an unplanned downpower to 90% due to a steam leak on the 1-5 drain tank access cover. Later that evening, operators performed a planned downpower to 80% to perform a rod pattern adjustment. While at reduced power, attempts to repair the steam leak on the 1-5 drain tank access cover were unsuccessful. Due to the leak, the second stage reheaters could not be placed in service, which limited power to 98%. The plant returned to 98% power on November 23, 2008.

On November 28, the plant experienced a load reject scram due to an internal fault on the M1A transformer. Exelon reported this event to the NRC in Event Notification 44688, "Automatic Reactor Scram Due to Main Transformer Fault." Additional information on this event is contained in section 4OA3 of this report. Exelon commenced a forced outage (1F17) on November 28, 2008 to replace the failed transformer. Exelon personnel performed additional maintenance activities during the outage, which included repairs to the 'A' high pressure feedwater heater, replacement of the failed feedwater temperature sensor and seal welding of the 1-5 drain tank access cover. Operators commenced a reactor startup and established the reactor critical on December 5, and synchronized the main generator to the grid and reached full power on December 6.

Oyster Creek operated at 100% (full) 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)

a. Inspection Scope (2 samples)

The inspectors performed one adverse weather preparation and one site specific weather-related condition inspection.

The inspectors reviewed Exelon's activities associated with seasonal readiness for cold weather conditions. The inspectors reviewed the updated final safety analysis report (UFSAR) for Oyster Creek to identify risk significant systems that require protection from cold weather conditions. The inspectors assessed the readiness of the service water, emergency service water, and fire protection systems to seasonal susceptibilities (extreme cold weather). The inspectors performed a walkdown of the service water, emergency service water, and fire protection systems and reviewed applicable corrective action program condition reports to assess their reliability and material condition. The inspectors also reviewed Exelon's cold weather preparation activities to assess their adequacy and to verify they were completed in accordance with procedure requirements.

The inspectors reviewed Exelon's response to high wind conditions on December 22 thru 24. During that period of time, strong westerly wind gusts had lowered intake levels below normal operating levels. The inspectors verified that operators properly monitored risk-significant plant equipment that could have been affected by the lowering intake level. The inspectors verified that Exelon had entered appropriate abnormal operating procedures in response to the lowering intake level. The inspectors performed walkdowns of the intake structure to assess any adverse equipment effects which may result from the lowering intake level.

Documents reviewed for this inspection activity are listed in the Supplemental Information attachment to this report.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

a. Inspection Scope (3 samples)

The inspectors performed three partial equipment alignment inspections. The partial equipment alignment inspections were completed during conditions when the equipment was of increased safety significance such as would occur when redundant equipment was unavailable during maintenance or adverse conditions, or after equipment was recently returned to service after maintenance. The inspectors performed a partial walkdown of the following systems, and when applicable, the associated electrical distribution components and control room panels, to verify the equipment was aligned to perform its intended safety functions:

- Containment spray/emergency service water system 2 on October 23;
- Standby liquid control system on November 17; and
- Emergency diesel generator #2 on November 21.

Documents reviewed for this inspection activity are listed in the Supplemental Information attachment to this report.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

a. Inspection Scope (71111.05Q - 4 samples)

The inspectors performed a walkdown of four plant areas to assess their vulnerability to fire. During plant walkdowns, the inspectors observed combustible material control, fire detection and suppression equipment availability, visible fire barrier configuration, and the adequacy of compensatory measures (when applicable). The inspectors reviewed "Oyster Creek Fire Hazards Analysis Report" and "Oyster Creek Pre-Fire Plans" for risk insights and design features credited in these areas. Additionally, the inspectors reviewed corrective action program condition reports documenting fire protection deficiencies to verify that identified problems were being evaluated and corrected. Documents reviewed for this inspection activity are listed in the Supplemental Information attachment to this report. The following plant areas were inspected:

- Northeast Corner Room (RB-FZ-1F4) on October 15;
- Northwest Corner Room (RB-FZ-1F3) on October 23;
- Motor Generator Set Room (OB-FZ-8A) on December 8; and
- Main Transformer Area (MT-FA-12) on December 22.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07)

a. Inspection Scope (1 sample)

The inspectors verified heat exchanger performance by reviewing the results of one heat exchanger performance test. The inspectors reviewed the data collected from the containment spray system #2 heat exchanger performance test on April 23, to verify that the heat exchanger was capable of performing its safety function. In addition, the inspectors reviewed the test procedure and results to verify that appropriate test controls were incorporated correctly into the procedure, test acceptance criteria were consistent with technical specification and UFSAR requirements, and that Exelon identified any potential heat exchanger deficiencies during testing. Documents reviewed are listed in the Supplemental Information attachment to this report.

b. Findings

No findings of significance were identified.

1R08 In-Service Inspection (71111.08)

a. Inspection Scope (1 Sample)

From October 27 thru November 5, the inspectors conducted a review of Exelon's implementation of in-service inspection (ISI) program activities for monitoring degradation of the reactor coolant system (RCS) boundary and risk significant piping system boundaries for Oyster Creek using the criteria specified in the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, 1995 Edition, with the 1996 Addenda, 10CFR 50.55a, "Codes and Standards", Boiling Water Reactor Vessel Internals Program recommendations, and station implementing procedures. The sample selection was based on the inspection procedure objectives and risk priority of those components and systems where degradation would result in a significant increase in risk of core damage. The inspectors reviewed documentation, observed in-process non-destructive examinations (NDE) and interviewed Exelon personnel to verify that inservice inspection activities were performed in accordance with the ASME Boiler and Pressure Vessel Code Section XI requirements.

The inspectors remotely observed shroud and steam dryer examinations (sampled VT-1 & VT-3 examinations), and performed direct field observation of six manual ultrasonic testing examinations. The review was performed to evaluate examiner skills and performance, to evaluate examination techniques, to assess contractor oversight activities, and to verify licensee and contractor ability to identify and characterize observed indications. In addition, dye penetrant (PT) examination data records, automated ultrasonic testing data records of the core spray safe-end-to-nozzle (N6A), recirculation safe-end-to-nozzle (N2C), and recirculation outlet nozzle-to-safe-end (N1A) were reviewed by the inspectors.

To verify suitability of materials, welding activities performed, applicable NDE performed, and ISI implementing procedures were in accordance with the ASME code requirements, the inspectors reviewed repair/replacement activities of shutdown cooling loop 'C' outlet isolation motor operated valve V-17-57 per work order C2012002. Magnetic particle and ultrasonic testing examination data sheets 1R21-240, and 1R21-241 associated with this valve replacement were reviewed.

The inspectors reviewed the In-Vessel-Visual-Inspection (IVVI) program and discussed the scope of examinations being performed with the General Electric (GE) Hitachi examination staff. The inspectors focused on visual examinations being performed on the shroud and steam dryer components and compared the visual inspection results to the previous outage examinations of these components. The inspectors confirmed that deficient conditions identified by GE Hitachi were entered into Oyster Creek's corrective action program.

The inspectors discussed operating experience (OE) on reactor vessel nozzle dissimilar metal weld intergranular stress corrosion cracking (IGSCC) with GE Hitachi personnel and Exelon staff to verify that they were aware of flaws identified at the Duane Arnold

and Hope Creek plants due to IGSCC. Because of this OE, the inspectors examined disposition for continued operation, without repair or rework, of non-conforming conditions and indications identified at Oyster Creek during 1R22 ISI activities. Specifically the inspectors reviewed Exelon's technical evaluation AT 00842492-03 associated with an indication 12 inches long in the circumferential extent and about 0.20 inch deep found in N1A nozzle-to-safe-end dissimilar metal weld NR02 4-565A of the recirculation piping that exceeds the acceptance standards of ASME Section XI, IWB-3514.14. Based on EPRI report IR-2008-340 evaluation of the examination data of this weld, the reported flaw at the N1A nozzle is embedded at the interface between the stainless steel clad and the ferritic base material and is not exposed to reactor coolant. The indication is considered a fabrication-induced flaw, not service induced. Mechanical Stress Improvement Process (MSIP) mitigation was performed on this weld during the 1994 refueling outage. Structural Integrity Associates (SIA) performed a flaw evaluation report 0801457.301R3 in accordance with ASME Section XI, IWB-3600 to determine acceptability for continued service. This SIA report concluded that the flaw identified in weld NR02 4-565A is acceptable for continued service for a period of 2 operating cycles. A teleconference was held on November 14 between Exelon and the NRC to discuss the identified flaw, the SIA flaw report and the EPRI report.

The inspectors also reviewed a sample of issue reports to assess Exelon's effectiveness in problem identification and resolution and determined that they are identifying ISI and NDE issues at an appropriate threshold and entering them into the corrective action program. The inspectors sampled condition reports from the current refueling outage 1R22 and from the time period since the last refueling outage 1R21.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

a. Inspection Scope (71111.11Q - 1 sample)

The inspectors observed one simulator training scenario on October 6, to assess operator performance and training effectiveness. The scenario involved an inadvertent opening of an electromatic relief valve (EMRV), a feedwater heater trip, loss of control rod drive flow, and an anticipated transient without scram (ATWS). The inspectors assessed whether the simulator adequately reflected the expected plant's response, operator performance met Exelon's procedural requirements, and the simulator instructor's critique identified crew performance problems. Documents reviewed for this inspection activity are listed in the Supplemental Information attachment to this report.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope (71111.12Q - 2 samples)

The inspectors performed two maintenance effectiveness inspection activities. The inspectors reviewed the following degraded equipment issues in order to assess the effectiveness of maintenance performed by Exelon:

- Conduct of maintenance on 480 VAC system (IR 842131) on November 7; and
- 1-5 moisture separator reheater drain tank leaking from northeast corner of tank (IR 848586) on November 22.

The inspectors reviewed completed maintenance work orders and procedures to determine if inadequate maintenance contributed to equipment performance issues. The inspectors also reviewed applicable work orders, corrective action program condition reports and operator narrative logs. Documents reviewed for this inspection activity are listed in the Supplemental Information attachment to this report.

b. Findings

Introduction. A self-revealing non-cited violation (NCV) of very low safety significance (Green) of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," occurred when Exelon did not perform an adequate self-check and did not properly use test equipment during the maintenance on a 480 VAC breaker. Specifically, on November 7, during the maintenance activity, a human performance error occurred in which a phase to phase fault caused an arc flash, and resulted in the loss of safety related equipment and an automatic halon system actuation. In response, Exelon entered this issue into the corrective action program and implemented action to address work practice deficiencies.

Description. On November 7, at around 3:00 PM, a contractor electrician cross connected electrical phases while attempting to perform a phase rotation check for the cleanup system pre-coat pump motor. At the time of this error, the plant was in the refueling mode of operation, with the shutdown cooling and fuel pool cooling systems in service for heat removal.

A typical means to verify proper motor/pump rotation associated with maintenance activities is to "bump" the motor by momentarily initiating a pump start signal and observing shaft rotation. However, the pre-coat pump had not been returned to service as expected, and the associated work order was revised to perform an electrical phase rotation check using test equipment.

The phase rotation instrument was designed for dual usage. It can either be used for motor rotation with no line voltage present (i.e., equipment not energized), or for 3-phase rotation (i.e., testing the energized part of the circuit; line voltage applied). The test instrument had two groups of three leads, one group for each of the test options. They are marked as motor rotation and 3-phase rotation, respectively. Although the electrician used the instrument on the energized connections at the associated 480 VAC breaker, the instrument was configured to be used for motor rotation (no line voltage) conditions.

While connecting the test instrument to the three phases of the breaker, the electrician made simultaneous contact with two of the phases, resulting in a phase to phase fault. This caused an arc flash and tripping of the electrical supply to the motor control center (MCC) 1B21. In addition, as a result of the arc flash, there was a significant amount of

smoke generated in the 480 VAC room, which caused an automatic discharge of the halon system. The electrician apparently had the alligator clip fully open while inserting the clip into the energized 480 VAC breaker cubicle. Exelon's subsequent investigation identified that the worker failed to use the STAR (Stop, Think, Act, Review) self-check/human performance tool and failed to recognize that having the alligator clip open could result in inadvertent contact with two terminal points within the breaker cubicle. Additionally, the worker was not wearing the required protective safety equipment (e.g., face shield, high voltage gloves, flame retardant outer clothing). As a consequence of not wearing the proper protective safety equipment, the worker received minor burns to his forearms.

The fire brigade responded to the fire alarm and the associated halon system actuation. Within 13 minutes of the halon system actuation, the fire brigade leader confirmed that there was no fire in the 480 VAC room. Exelon reviewed the potentially applicable emergency action level categories, including those for fire and toxic/flammable gases, and confirmed that no declaration thresholds were met.

The inspectors responded to the control room and the 480 VAC room to assess plant conditions and licensee response. While the inspectors confirmed that there was no significant adverse operational or nuclear safety impact due to the electrical transient, several safety related components became unavailable due to the trip of the MCC electrical supply, including the 'B' fuel pool cooling pump, remote operation of a shutdown cooling system cooling water valve, and both core spray system fill pumps. Accordingly, Exelon instituted appropriate contingency actions, which included providing an alternate means to fulfill the function of the core spray keep-fill system.

The inspectors observed Exelon's response to this event, including operator and fire brigade actions, emergency action level assessment, system and component availability/operability and compliance with technical specifications, implementation of contingency actions, and additional corrective actions. The inspectors also walked down the affected 480 VAC room components. The affected MCCs were subsequently re-energized at 5:29 AM on November 8. Following the event, station management instituted an electrical work stoppage/stand down, with discussion of this event focusing on use of the proper tools for work and recognizing potential hazards and wearing the proper protective safety equipment. The inspectors reviewed Exelon's response for this event, including corrective actions, and found them to be adequate.

The performance deficiency associated with this finding involved Exelon not properly implementing the requirements contained in procedure MA-AA-1000, "Conduct of Maintenance Manual." Specifically, the contractor electrician did not perform an adequate self-check of his work and did not properly use test equipment. Further, the electrician did not properly utilize personal protective equipment as required by MA-AA-1000, "Conduct of Maintenance Manual."

<u>Analysis</u> The inspectors determined that Exelon personnel did not implement the requirements of procedure MA-AA-1000, "Conduct of Maintenance Manual." The finding was more than minor because it was associated with the human performance attribute of the Initiating Events Cornerstone and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. This finding was also similar to example

4.b in NRC Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports, " Appendix E, "Examples of Minor Issues," in that Exelon did not adequately self-check to ensure the instrument alligator clip was properly connected to the appropriate breaker leads.

In accordance with NRC Inspection Manual Chapter 0609, Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process Phase 1 Operational Checklists for Both PWRs [Pressurized Water Reactors] and BWRs [Boiling Water Reactors]," the inspectors evaluated the significance of this finding. The inspectors determined that Checklist 7, BWR Refueling Operation with Reactor Coolant System Level > 23 feet," was applicable. The finding was determined to have very low safety significance (Green) because it did not increase the likelihood of a loss of reactor coolant system (RCS) inventory, did not affect the licensee's ability to terminate a leak path or add inventory to the RCS, or degrade the licensee's ability to recover decay heat removal in the event it was lost.

The performance deficiency had a cross-cutting aspect in the area of human performance because Exelon personnel did not properly implement human error prevention techniques, such as self and peer checking [H.4(a)].

Enforcement. 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and drawings," requires, in part, that activities affecting quality shall be prescribed by documented procedures of a type appropriate to the circumstances and shall be accomplished in accordance with these procedures. Exelon maintenance procedure MA-AA-1000 is a procedure affecting quality that establishes the maintenance standards of performance. This procedure states, in part, that self-check shall be used for equipment manipulation, tools and test equipment shall be used properly, and required protective safety equipment shall be worn. Contrary to the above, on November 7, a contractor electrician did not perform an adequate self-check and did not properly use test equipment during maintenance, resulting in a phase to phase fault, halon system actuation, and a loss of safety related equipment. In addition, the worker did not wear the required protective safety equipment during the work activity. Because this issue was of very low safety significance (Green) and Exelon has entered this issue into their corrective action program in condition report IR 842131, this violation is being treated as an NCV consistent with Section VI.A.1 of the NRC Enforcement Policy. **(NCV 05000219/2008005-01: Conduct of Maintenance Procedure Not Properly Implemented)**

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope (71111.13 - 4 samples)

The inspectors reviewed four on-line risk management evaluations through direct observation and document reviews for the following plant configurations:

- Containment spray system 1, 'A' control rod drive pump and 'B' motor generator set unavailable due to planned maintenance on October 16;
- Core spray system 2 unavailable due to planned maintenance and '1-3' station air compressor unavailable due to unplanned maintenance on December 15;

- Turbine building closed cooling water system heat exchanger 1 unavailable due to planned maintenance, '1-3' station air compressor unavailable due to unplanned maintenance and elevated temperatures on B Isolation Condenser Shell on December 18; and
- #2 air compressor trip due to inlet flow restriction on December 26.

The inspectors reviewed the applicable risk evaluations, work schedules, and control room logs for these configurations to verify the risk was assessed correctly and reassessed for emergent conditions in accordance with Exelon's procedures. Exelon's actions to manage risk from maintenance and testing were reviewed during shift turnover meetings, control room tours, and plant walkdowns. The inspectors also used Exelon's on-line risk monitor (Paragon) to gain insights into the risk associated with these plant configurations. Additionally, the inspectors reviewed corrective action program condition reports documenting problems associated with risk assessments and emergent work evaluations. Documents reviewed for this inspection activity are listed in the Supplemental Information attachment to this report.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope (2 samples)

The inspectors reviewed two operability evaluations for degraded or non-conforming conditions associated with:

- GEMAC wide range reactor vessel level instrument on November 6 (IR 836518); and
- Source range monitor (SRM) 21 on November 26 (IR 841602).

The inspectors reviewed the technical adequacy of the operability evaluations to ensure the conclusions were technically justified. The inspectors also walked down accessible portions of equipment to corroborate the adequacy of Exelon's operability evaluations. Documents reviewed for this inspection activity are listed in the Supplemental Information attachment to this report.

b. Findings

No findings of significance were identified.

1R18 Plant Modifications (71111.18)

a. Inspection Scope (2 samples)

The inspectors reviewed one permanent plant modification and one temporary plant modification that was installed when Oyster Creek was on line.

The permanent modification involved the replacement of check valve V-5-165 due to a failed local leak rate test (LLRT). Specifically, after failing its local leak rate test, Exelon replaced V-5-165 with a suitable replacement and retested the valve satisfactorily. The inspectors reviewed the engineering change package, design and licensing basis documentation to ensure that the changes implemented by Exelon were in accordance with plant procedures and NRC regulations. The inspectors ensured that appropriate revisions to licensing and design documents and operating procedures were being made and would support operations when the modifications were completed.

The temporary modification involved the installation of a temporary filter in the control rod drive (CRD) system during refueling outage 1R22. The inspectors reviewed the engineering change package, design and licensing basis documentation to ensure that the changes implemented by Exelon were in accordance with plant procedures and NRC regulations. The inspectors walked down portions of the systems while the temporary modification was being removed.

The inspectors also reviewed Exelon's 10 CFR 50.59 screening for the modifications. Documents reviewed for this inspection activity are listed in the Supplemental Information attachment to this report.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope (4 samples)

The inspectors observed portions of and reviewed the results of four post-maintenance tests for the following equipment:

- '1-1' emergency service water pump replacement on October 16 (WO R2126593);
- LLRT of check valve V-5-165 on December 2 (A2184770);
- Post installation testing of the M1A main transformer deluge system on December 12 (WO C2002155); and
- Replacement of hydraulic control unit 50-35 hydraulic accumulator on December 12 (WO C2017578).

The inspectors verified that the post-maintenance tests conducted were adequate for the scope of the maintenance performed and that they ensured component functional capability. Documents reviewed for this inspection activity are listed in the Supplemental Information attachment to this report.

b. Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope (2 samples)

The inspectors monitored Exelon's activities associated with one refueling and one other outage activity. Documents reviewed for this inspection activity are listed in the Supplemental Information attachment to this report.

Refueling Outage (1R22)

On October 24, operators initiated a plant shutdown to support the 1R22 refueling outage. The inspectors observed portions of the shutdown from the control room, and reviewed plant logs to determine that technical specification (TS) requirements were met for placing the reactor in "hot shutdown" and "cold shutdown." The inspectors also monitored Exelon's controls over outage activities to determine whether they were in accordance with procedures and applicable TS requirements.

The inspectors verified that cooldown rates during the plant shutdown were within TS requirements. The inspectors performed a walkdown of portions of the drywell in conjunction with Exelon's initial inspection of the drywell (primary containment) immediately following reactor shutdown on October 25. The inspectors performed additional walkdowns of portions of the drywell on October 28, November 3, November 5, and November 17; and the condenser bay and the main steam tunnel on October 30, to verify there was no evidence of leakage or visual damage to passive systems contained in these areas. During the walk down of the drywell the inspectors observed that the drywell trenches discussed in PNO-1-06-012, "Preliminary Notification of Event of Unusual Occurrence," dated November 9, 2006 (ADAMS Accession Number: ML063130424), did not contain water upon initial entry on October 25 or on November 5. During final drywell closeout on November 17, a trace amount of water was identified in the Bay 5 trench. The likely source of the water was from recently completed maintenance that occurred in its vicinity. The water was removed by Exelon personnel prior to the drywell being locked (IR 846240).

The inspectors verified that Exelon assessed and managed the outage risk. The inspectors confirmed on a sampling basis that tagged equipment was properly controlled and equipment configured to safely support maintenance work. During control room tours, the inspectors verified that operators maintained reactor vessel level and temperature within the procedurally required ranges for the operating condition. The inspectors also verified that the decay heat removal function was maintained through monitoring shutdown cooling (SDC) system parameters during plant status and performing a walkdown of the system on October 25. The inspectors observed Oyster Creek's plant onsite review committee (PORC) startup affirmations from November 14 through November 16.

The inspectors determined that offsite and onsite electrical power sources were maintained in accordance with TS requirements and consistent with the outage risk assessment. Periodic walkdowns of portions of the onsite electrical buses and the emergency diesel generators were conducted during risk significant electrical configurations to confirm the equipment alignment met requirements. The inspectors verified through routine plant status activities that decay heat removal safety function was maintained with appropriate redundancy as required by TS and consistent with Exelon's outage risk assessment. The inspectors verified that flow paths, configurations, and alternative means for inventory control were consistent with the outage risk assessment.

The inspectors performed walkdowns of the poly bottles in the torus room to determine if water was accumulating in the drywell sand bed drains on October 27 and November 10. The poly bottles did not contain or show evidence of water on those dates.

The inspectors performed an inspection and walkdowns of portions of the drywell prior to containment closure on November 17, to verify there was no evidence of leakage or visual damage to passive systems and to determine whether debris was present which could affect drywell suppression pool performance during postulated accident conditions. The inspectors monitored restart activities that began on November 17, to ensure that required equipment was available for operational condition changes, including verifying TS requirements, license conditions, and procedural requirements. Portions of the startup activities were observed from the control room to assess operator performance including achievement of reactor criticality on November 17, placing the mode switch to run and synchronization of the main turbine generator to the grid on November 18. The inspectors further verified that unidentified leakage and identified leakage rate values were within expected values and within technical specification requirements.

Other Outage Activity – Forced Outage due to Main Transformer Failure (1F17). On November 28, an automatic load reject scram occurred due to a failure of the M1A Main Transformer. Details of the scram and operator response to the scram are provided in section 4OA3. The inspectors responded to the control room and observed portions of the post-scram recovery and plant cooldown. The inspectors verified that cooldown rates during the plant shutdown were within TS requirements. The drywell remained closed and inerted throughout the outage.

The inspectors verified that Exelon assessed and managed the outage risk. The inspectors confirmed on a sampling basis that tagged equipment was properly controlled and equipment configured to safely support maintenance work. During control room tours, the inspectors verified that operators maintained reactor vessel level and temperature within the procedurally required ranges for the operating condition. The inspectors also verified that the decay heat removal function was maintained through monitoring shutdown cooling (SDC) system parameters during plant status and performing a walkdown of the system on December 1. The inspectors observed Oyster Creek's PORC startup affirmations on December 3 and December 4.

Operators commenced a reactor startup and established the reactor critical on December 5, and synchronized the main generator to the grid and reached full power on December 6.

b. Findings

Introduction. The inspectors identified an NCV of TS 3.9.D, "Refueling", when Exelon performed core alterations without the required configuration of operable source range monitors (SRM). Specifically, Exelon installed two fuel assemblies in a quadrant when the required configuration of SRMs was not operable. In response, Exelon entered this issue into the corrective action program and implemented actions to revise the reactor refueling procedure.

Description. On November 7, during plant status review, the inspectors identified that SRM 21 was listed as out of service at 9:24 PM on November 6 and declared inoperable at 11:53 PM. Exelon had commenced the second phase of refueling at 10:30 PM on November 6. After reviewing the technical specifications and refueling procedure fuel move sheets, the inspectors identified that two fuel assemblies were installed in reactor quadrant one at 10:52 PM and 11:23 PM, during which time SRM 21 was inoperable. Technical Specification 3.D.9 requires SRM 21 and either SRM 22 or 24 to be operable when performing core alterations in reactor quadrant one. The inspectors engaged the Shift Manager and were told that the guidance contained in Exelon procedure 205.0, "Reactor Refueling" allowed monitoring of the two fuel movements in question with either SRM 21 or SRM 22 operable. The inspectors brought the discrepancy between the guidance contained in the refueling procedure and the requirements contained in TS to the attention of Exelon licensing staff, who verified that the procedure did conflict with the requirements contained in the TS and entered the issue into the corrective action program as IR 844470. SRM 21 was repaired and returned to service at 6:55 PM on November 8.

The performance deficiency associated with this finding involved Exelon not properly implementing the requirements of TS 3.9.D and moved fuel without the required SRMs to monitor the fuel movements.

Analysis. The inspectors determined that Exelon personnel did not properly implement the requirements of TS 3.9.D. The finding is more than minor because it affects the configuration control attribute of the barrier integrity cornerstone objective of providing reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, during a time of decreased availability of physical barriers (refueling outage), Exelon performed fuel movements without the required configuration of operable source range monitors.

Using Appendix G, "Shutdown Operations Significance Determination Process," of Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance (Green) because it did not increase the likelihood of a loss of reactor coolant system (RCS) inventory, did not affect the licensee's ability to terminate a leak path or add inventory to the RCS, or degrade the licensee's ability to recover decay heat removal in the event it was lost.

The performance deficiency had a cross-cutting aspect in the area of human performance, because Exelon did not ensure that the reactor refueling procedures accurately implemented the neutron monitoring requirements contained in the Technical Specifications [H.2(c)].

Enforcement. TS 3.9.D states that at least two SRM channels shall be operable during core alterations. Additionally, TS 3.9.D requires that one of the operable SRM channels shall be located in the core quadrant where core alterations are being performed, and the other shall be in an adjacent quadrant. Contrary to the above, on November 6, 2008, the licensee performed core alterations (installed 2 new fuel assemblies) in quadrant one of the reactor while SRM channel 21 was inoperable. Because this issue is of very low safety significance (Green) and Exelon entered this issue into their corrective action program (IR 844470), this violation is being treated as an NCV,

consistent with Section VI.A.1 of the NRC Enforcement Policy. **(NCV 05000219/2008005-02, "Core Alterations Performed Without the Required Configuration of Source Range Nuclear Monitors.")**

1R22 Surveillance Testing (71111.22)

a. Inspection Scope (4 samples – 1 In-Service Testing, 1 Routine Surveillance, and 2 LLRT)

The inspectors observed portions of and reviewed the results of four surveillance tests:

- Standby liquid control in-service test on September 30;
- Main steam isolation valve local leak rate test on October 30;
- Isolation condenser vent valve (V-14-1) local leak rate test on October 31; and
- Emergency diesel generator #1 loss of offsite power testing on November 3.

The inspectors verified that test data was complete and met procedural requirements to demonstrate that the systems and components were capable of performing their intended function. The inspectors also reviewed corrective action program condition reports that documented deficiencies identified during these surveillance tests. Documents reviewed for this inspection activity are listed in the Supplemental Information attachment to this report.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness [EP]

1EP2 Alert and Notification System (ANS) Evaluation (71114.02)

a. Inspection Scope (1 Sample)

An onsite review was conducted to assess the maintenance and testing of the Oyster Creek ANS. During this inspection, the inspectors interviewed the ANS Manager who is responsible for implementation of the ANS testing and maintenance program. The inspectors further discussed with the ANS manager the performance of the ANS siren system from February 2007 through September 2008. The inspectors reviewed the ANS procedures and the ANS design report to ensure compliance with those commitments for system maintenance and testing. Additionally, the inspectors reviewed changes to the design report and how these changes are captured. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 2. Planning standard, 10 CFR 50.47(b) (5) and the related requirements of 10 CFR 50, Appendix E were used as reference criteria. Documents reviewed for this inspection activity are listed in the Supplemental Information attachment to this report.

b. Findings

No findings of significance were identified.

1EP3 Emergency Preparedness Organization Staffing and Augmentation System (71114.03)

a. Inspection Scope (1 Sample)

A review of Oyster Creek's Emergency Response Organization (ERO) augmentation staffing requirements and the process for notifying the ERO was conducted. This was performed to ensure the readiness of key staff for responding to an event and to ensure timely facility activation. The inspectors reviewed procedures and condition reports associated with the ERO notification system and drills, and reviewed records from call-in drills from February 2007 through September 2008. The inspectors interviewed personnel responsible for testing the ERO augmentation process, and reviewed the training records for a sampling of ERO responders to ensure training and qualifications were up to date. The inspectors reviewed procedures for ERO administration and training, and verified a sampling of ERO responders who participated in exercises in 2007 and 2008. The inspectors also reviewed records of offsite agency training. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 3. Planning standard, 10 CFR 50.47(b) (2) and related requirements of 10 CFR 50 Appendix E were used as reference criteria. Documents reviewed for this inspection activity are listed in the Supplemental Information attachment to this report.

b. Findings

No findings of significance were identified.

1EP4 Emergency Action Level (EAL) and Emergency Plan Changes (71114.04)

a. Inspection Scope (1 Sample)

The inspectors conducted a review of Oyster Creek's 10 CFR 50.54(q) screenings for all the changes made to the EALs and all of the changes made to the Emergency Plan from June 2006 through September 2008 that could potentially result in a decrease in effectiveness. This review of the EAL and Emergency Plan changes did not constitute NRC approval of the changes and, as such, the changes remain subject to future NRC inspection. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 4. The requirements of 10 CFR 50.54(q) were used as reference criteria. Documents reviewed for this inspection activity are listed in the Supplemental Information attachment to this report.

b. Findings

No findings of significance were identified.

1EP5 Correction of Emergency Preparedness Weaknesses (71114.05)

a. Inspection Scope (1 Sample)

The inspectors reviewed a sampling of self-assessment procedures and reports to assess Oyster's Creek's ability to evaluate their performance and programs. The inspectors reviewed a sampling of condition reports from January 2007 through

September 2008 initiated by Oyster Creek from drills, self-assessments and audits. Additionally, the inspectors reviewed audits for 2007 and 2008 that were required by 10 CFR 50.54(t). This inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 5. Planning standard, 10 CFR 50.47(b) (14) and the related requirements of 10 CFR 50 Appendix E were used as reference criteria. Documents reviewed for this inspection activity are listed in the Supplemental Information attachment to this report.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety [OS]

2OS1 Access Control to Radiologically Significant Areas (71121.01)

a. Inspection Scope (17 samples)

The inspectors reviewed external and internal occupational dose assessments relative to applicable performance indicators (PIs). (See Section 4OA1)

The inspectors identified exposure significant work areas during station tours and walked down selected radiological controlled areas and conducted independent radiation surveys. The inspectors observed and evaluated housekeeping, material conditions, posting, barricading, and access controls to determine if radiological controls were acceptable. The inspectors determined that prescribed radiation work permit (RWP), procedure, and engineering controls were in place. The inspectors attended job briefings and evaluated Exelon's use of approved respiratory protective equipment. The inspectors conducted independent radiation surveys with a survey instrument to evaluate ambient conditions and adequacy of applied radiological controls.

The inspectors toured outage work areas and reviewed on-going radiologically significant work activities in the drywell, reactor building, turbine building, and refueling floor. The inspectors conducted direct observation and review of on-going outage work activities such as reactor disassembly, reactor refueling, in-vessel inspection, turbine blade repairs, turbine control and stop valve repairs, turbine component sand blasting, condenser bay valve repair, replacement of electromatic relief and safety valves, and repairs to 'C' reactor recirculation pump. The inspectors reviewed the Exelon's radiation protection refuel outage readiness checklists. The inspectors reviewed Exelon's implementation of TS high radiation area controls. The review included evaluation of the adequacy of applied radiological controls, including RWPs, procedure adherence, radiological surveys, system breach surveys, airborne radioactivity sampling, contamination controls, and barrier integrity and associated engineering control performance. The inspectors evaluated the adequacy of personnel monitoring in areas of potential dose rate gradients. The inspectors reviewed use of electronic dosimeters (ED) including the adequacy of ED setpoints, verified that workers knew actions to take upon receipt of an ED alarm and compared of ED exposure results with thermoluminescent dosimeter exposure results.

The inspectors reviewed internal dose assessments for 2008 to identify apparent occupational internal doses greater than 50 millirem committed effective dose equivalent (CEDE). The review included evaluation of the adequacy of selected dose assessments and review of the program for evaluation of potential intakes associated with hard-to-detect radionuclides (e.g., transuranics). The inspectors reviewed applicable 10 CFR Part 61 waste stream analysis and scaling factor reports.

The inspectors attended an Oyster Creek ALARA Committee meeting held to discuss outage performance, including personnel contamination frequency and internal exposures status.

The inspectors reviewed physical and programmatic controls for highly activated or contaminated non-fuel items stored within spent fuel or other storage pools.

The inspectors conducted post-outage station tours and walked down radiological controlled areas to evaluate post-outage housekeeping, material conditions, posting, barricading, and access controls.

The inspectors reviewed self-assessments and audits to determine if identified problems were entered into the corrective action program for resolution. The inspectors evaluated the database for repetitive deficiencies or significant individual deficiencies to determine if self-assessment activities were identifying and addressing deficiencies at an appropriate threshold. The review included evaluation of data to determine if any deficiencies involved PI events with dose rates greater that 25 R/hr at 30 centimeters, greater than 500 R/hr at 1 meter or unintended exposures greater than 100 millirem total effective dose equivalent (TEDE), 5 rem shallow dose equivalent (SDE), or 1.5 rem lens dose equivalent (LDE).

The inspection included a review of condition reports which involved potential radiation worker or radiation protection personnel errors to determine if there was an observable pattern traceable to a similar cause and an evaluation of corrective actions. In addition, the inspectors reviewed outage radiological oversight activities.

The inspectors discussed high radiation area (HRA) access control procedure changes implemented since the last inspection with the Radiation Protection Manager and selected supervisors to determine if the changes resulted in a reduction in the effectiveness and level of worker protection. During station tours, the inspectors reviewed implementation of HRA and very high radiation area (VHRA) controls and discussed HRA controls with in-field, lead radiological controls personnel. The inspectors reviewed posting, barricading, and locking of HRAs. The inspectors discussed controls established for special areas that had the potential to become Very High Radiation Areas. The inspectors conducted a locked HRA key inventory to validate proper control and issuance of locked HRA access keys.

During station tours, the inspectors observed radiation worker performance with respect to stated RWP requirements. The inspectors questioned workers to determine if they were aware of the significant radiological conditions in their workplace, the RWP controls/limits in place, and if their work performance took into consideration the level of radiological hazards present. The inspectors questioned workers in various areas of the

radiological controlled area to determine their knowledge of ambient radiological conditions. Documents reviewed for this inspection activity are listed in the Supplemental Information attachment to this report.

b. Findings

No findings of significance were identified.

2OS2 ALARA Planning and Controls (71121.02)

Inspection Scope (8 samples)

The inspectors performed the following samples to determine if Exelon was implementing operational, engineering, and administrative controls to maintain personnel occupational radiation exposure as low as is reasonably achievable (ALARA). The review was based upon the criteria contained in 10 CFR 20, applicable industry standards and Oyster Creek procedures.

The inspectors reviewed pertinent information regarding station collective dose history, current exposure trends, and ongoing or planned activities in order to assess current performance and exposure challenges.

The inspectors determined the site specific trends in collective exposures (using NUREG-0713 and plant historical data), source-term (average contact dose rate with reactor coolant piping) measurements and the plant's three-year rolling average collective exposure. The inspectors reviewed site specific procedures associated with maintaining occupational exposures ALARA. The inspectors also reviewed the processes used to estimate and track activity specific exposures.

The inspectors reviewed planning and preparation for the refueling outage to determine if Exelon had established procedures, engineering and work controls, based upon sound radiation protection principles, to achieve occupational exposures that were ALARA.

The inspectors selected work activities likely to result in the highest collective personnel radiation exposures and reviewed the planning and preparation for those work activities to determine if ALARA requirements were integrated into work procedure and RWP documents. Specifically, the work activities reviewed by the inspectors were under vessel work (control rod drive change-out), in-service inspection, scaffolding activities, various valve work activities, refueling activities, and radiological controls coverage.

The inspectors compared the results achieved (dose and dose rate reductions, person-rem expended) with the estimated occupational doses established in the initial ALARA plans for selected work activities conducted during the fall 2008 refueling outage. The inspectors reviewed implementation of program requirements for re-evaluation of dose estimates including re-review of work plans by the Oyster Creek ALARA Committee. The inspectors also reviewed exposure tracking for ongoing outage activities.

The inspectors reviewed under vessel work/control rod drive change-out, in-service inspection, scaffolding activities, various valve work activities, refueling activities, and radiological controls coverage. The inspectors evaluated the use of ALARA controls for

these work activities by reviewing use of engineering controls, implementation of ALARA procedures and controls, and use of shielding.

The inspectors observed workers to determine if workers were utilizing low dose waiting areas and to determine if workers received appropriate on-the-job supervision to ensure the ALARA requirements were met. The inspectors also reviewed job supervisor oversight to ensure the work activities were conducted in a dose efficient manner (e.g., work crew size minimized, workers properly trained, proper tools and equipment). The inspectors attended worker briefings to evaluate the adequacy of radiological controls briefings and reviewed exposures of individuals from selected work groups.

The inspectors reviewed Exelon's evaluations and efforts in the area of source term controls. Areas reviewed included shielding, chemical controls, shutdown methodology, flood-up strategy, and clean-up strategies. The inspectors also reviewed radiation measurements on primary system piping, including trends and current status. The inspectors also discussed longer term source term reduction plans and efforts with Oyster Creek managers. The inspectors made independent radiation measurements during tours to validate efforts.

The inspectors observed radiation worker and radiation protection technician performance during work activities being performed in radiation areas, airborne radioactivity areas, and high radiation areas. The inspectors observed activities that presented the greatest radiological risk to workers (e.g., under vessel work, reactor refueling pool work). The inspectors evaluated observed work practices to determine if workers demonstrated the ALARA philosophy in practice (e.g., were workers familiar with the work activity scope and tools to be used, were workers utilizing ALARA low dose waiting areas) and whether there were any procedure compliance issues (e.g., were work activity controls followed). The inspectors observed worker/technician performance to determine if performance was consistent with expectations considering potential radiological hazards and the work involved.

The inspectors reviewed the exposure and monitoring controls employed by Exelon for declared pregnant workers with respect to 10 CFR 20 requirements.

The inspectors reviewed self-assessments, audits, and special reports related to the ALARA program to determine if identified problems were entered into the corrective action program for resolution. The inspectors reviewed dose significant post-job (work activity) reviews and post-outage ALARA report critiques of exposure performance to determine if identified problems were properly characterized, prioritized, and resolved in an expeditious manner.

The inspectors reviewed overall ALARA performance for 2008 including the refueling outage. The inspectors compared accrued occupational dose for various work tasks, relative to initial task estimates. Outage tasks reviewed, relative to initial estimates, included under vessel work/control rod drive change-out, in-service inspection, scaffolding activities, shielding activities, various valve work activities, recirculation system pump and motor work, and various refueling activities including reactor disassembly and reassembly.

The inspectors evaluated assumptions and bases for current annual collective exposure estimates and reviewed the dose rate and person-hour estimates (versus actual sustained) for accuracy, for the tasks reviewed.

The inspectors reviewed procedures and methods used to adjust exposure estimates (e.g., work-in-progress reviews) or modifying existing work packages, caused when unexpected changes in scope or emergent work are encountered. The inspectors also reviewed the level of tracking detail, exposure report timeliness, and exposure report distribution. Documents reviewed for this inspection activity are listed in the Supplemental Information attachment to this report.

b. Findings

No findings of significance were identified.

2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03)

a. Inspection Scope (2 samples)

The inspectors reviewed the radiological source term, based on 10 CFR Part 61 data, to identify potential changes in radiation types and energies that could impact instrument calibrations and/or analyses. The inspectors reviewed calibration records and operability determination documentation for selected instruments used for job coverage.

The inspectors reviewed audits and self-assessments in the area of radiation monitoring equipment and protective equipment to determine if identified issues in this area were entered into the corrective action program. The inspectors reviewed condition reports and action requests to evaluate Exelon's threshold for identifying, evaluating, and resolving problems in this area. Documents reviewed for this inspection activity are listed in the Supplemental Information attachment to this report.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES [OA]

4OA1 Performance Indicator (PI) Verification (71151)

a. Inspection Scope (10 samples)

The inspectors reviewed Exelon's program to gather, evaluate, and report information on five performance indicators (PIs) associated with the mitigating systems performance index (MSPI). The inspectors used the guidance provided in Nuclear Energy Institute (NEI) 99-02, Revision 5, "Regulatory Assessment Performance Indicator Guideline" to assess the accuracy of Exelon's collection and reporting of PI data. The inspectors reviewed operating logs and corrective action program condition reports. The inspectors verified the accuracy and completeness of the reported data from October 1, 2007 through September 30, 2008 for the following PIs:

- Emergency AC Power System;
- High Pressure Injection System;
- Heat Removal System;
- Residual Heat Removal System; and
- Cooling Water Systems.

The inspectors reviewed Exelon's program to gather, evaluate, and report information on three performance indicators (PIs) associated with the Emergency Plan. The inspectors reviewed supporting documentation from drills and tests for July 1, 2007 through September 30, 2008, to verify the accuracy of the reported data. The acceptance criteria used for the review were 10 CFR 50.9 and NEI 99-02, Revision 5, "Regulatory Assessment Performance Indicator Guidelines." The PIs included:

- Drill and Exercise Performance (DEP);
- ERO Drill Participation; and
- ANS Reliability.

The inspectors reviewed Exelon's Occupational Exposure Control Effectiveness Performance Indicator (PI) Program. The inspectors reviewed corrective action program records for occurrences involving High Radiation Areas, Very High Radiation Areas, and unplanned personnel radiation exposures since the last inspection in this area. The acceptance criteria used for the review was that specified in NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Rev. 5. The purpose of this review was to verify that occurrences that met NEI criteria were recognized and identified as Performance Indicators. Documents reviewed for this inspection activity are listed in the Supplemental Information attachment to this report.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Review of Items Entered Into the Corrective Action Program

a. Inspection Scope (1 sample)

The inspectors performed a daily screening of items entered into Exelon's corrective action program to identify repetitive equipment failures or specific human performance issues for follow-up. This was accomplished by reviewing hard copies of each condition report, attending daily screening meetings, or accessing Exelon's computerized database.

b. Findings

No findings of significance were identified.

.2 Semi-Annual Review to Identify Trends

a. Inspection Scope (1 sample)

The inspectors performed one semi-annual trend review. The inspectors reviewed Exelon's corrective action program documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors also performed a walkdown of equipment important to safety to ensure issues were being properly identified and corrected in the corrective action program. The review was focused on repetitive equipment problems, human performance issues, and program implementation issues. The results of the trend review by the inspectors were compared with the results of normal baseline inspections. The review included issues documented outside the normal corrective action system, such as in system health reports and Oyster Creek monthly management reports. The review considered a six-month period of June 1, 2008 through December 18, 2008.

b. Assessment and Observations

No findings of significance were identified.

The inspectors reviewed corrective action program condition reports for five high risk maintenance rule systems (core spray, containment spray, emergency service water, isolation condenser and electromatic relief valves) and did not identify any adverse trends. The inspectors also reviewed corrective action program conditions reports associated with human performance issues and program implementation and did not identify any significant adverse trends.

.3 Annual Sample Review (2 samples)

Operator Work-Arounds

a. Inspection Scope

The inspectors reviewed equipment issues that were identified by Exelon as operator work-arounds (OWAs) and operator challenges. The inspectors verified that the OWAs were being properly controlled as specified by OP-AA-102-103, "Operator Work-Around Program." The inspectors assessed the cumulative impact of the identified OWAs, operator challenges, and control room deficiencies by performing a detailed document review and interviewing operations personnel during the week of December 23, 2008. In addition, the inspectors conducted a walkdown of the main control room and risk significant plant areas to determine if these deficiencies adversely affected the ability of operations personnel to implement emergency operating procedures or respond to plant transients.

b. Findings and Observations

No findings of significance were identified. The inspectors verified that OWAs were being identified at an appropriate threshold, entered into the corrective action program, tracked for resolution, and the cumulative effects of OWAs for mitigating systems were evaluated to determine the overall impact on the affected systems.

Review of Stack Radiation Monitor System

a. Inspection Scope

The inspectors reviewed the availability and operation of the station's stack radiation monitor system (corrective action program condition reports IR 661532 and IR 658467). Exelon had been experiencing difficulty with the system's auto-filter changer apparatus. The inspectors discussed the status of the system with chemistry personnel responsible for effluent sampling and also discussed system operation with the system engineer. The inspectors also reviewed corrective action documentation associated with the operation and availability of the system.

b. Findings and Observations

Introduction. An unresolved item (URI) was identified because additional information and a review of system sampling capabilities is required to determine if there are any impacts to Oyster Creek's emergency plan and to determine if any performance deficiency exists. The inspectors plan to review the additional information after it is complied by Exelon, which had not occurred by the end of this inspection period.

Description. As a result of the difficulties experienced with the in-line auto filter change apparatus, Exelon has initiated action to replace the system with an updated model. In the interim, the installed conventional direct in-line particulate and iodine sampling system was placed in service to implement the sampling provisions of Oyster Creek's Offsite Dose Calculation Manual (ODCM). The sampling system continues to auto-adjust flow rates to ensure proper collection of isokinetic samples. A separate sampling apparatus provides for sampling of tritium. A review of the availability of the system indicates the system has met requirements for sampling in accordance with the ODCM and has maintained high reliability. At the time of this inspection, the inspectors had not completed a review of potential emergency response implications associated with collection and analysis of particulate and iodine samples during accident conditions, relative to the changes in sample collection methodology (i.e., inability to use the auto-filter change-out capability). Exelon is providing additional information regarding collecting samples using the installed in-line particulate and iodine sampling system. Inspectors will review the additional information against the requirements of the emergency plan to determine if a performance deficiency exists. **(URI 05000219/2008005-03: Stack Radiation Monitoring System Sampling Capabilities)**

4OA3 Event Follow-up (71153) (3 samples)

The inspectors performed three event follow-up inspection activities. Documents reviewed for this inspection activity are listed in the Supplemental Information attached to this report.

.1 Fire in 480 VAC Junction Box

a. Inspection Scope

On October 23, operations personnel in the control room responded to a 480 VAC junction box fire in the vicinity of the breathing air compressor building (IR 835031). The fire had no effect on plant operations but did interrupt power to the Breathing Air Compressor Building and the Monitor and Control Facility (MAC).

The inspectors arrived on site after being informed of the event on October 23. The inspectors performed a walkdown of the control room and discussed the issue with Exelon personnel in order to understand the effects of a loss of power to the MAC facility and the breathing air system on plant operations. The inspectors also reviewed operator logs, plant process computer (PPC) data, and system drawings to verify that there was no effect on plant operations.

b. Findings

No findings of significance were identified.

.2 Arc Flash / Smoke in 480 VAC Switchgear Room

a. Inspection Scope

On November 7, operations personnel in the control room responded to alarms that indicated a fire in the 480 VAC room. Coincidentally, in-field personnel reported the presence of heavy smoke in the 480 VAC room. The inspectors responded to the control room after being informed of the event. The inspectors performed a walkdown of the control room and discussed the associated event details with Exelon personnel in order to understand the extent of the issues with the 480 VAC system, and any potential impact to the plant. The inspectors also reviewed operator logs, PPC data, and system drawings to understand the plant's response. The inspectors also interviewed engineering and maintenance personnel to understand the circumstances surrounding the work activity that was being performed in the 480 VAC room, during which the arc flash occurred. Subsequent to the initial recovery of the 480 VAC system, the inspectors ensured no additional issues were observed with the 480 VAC system. The maintenance effectiveness issues are discussed in Section 1R12 of this report.

b. Findings

No findings of significance were identified.

.3 Scram due to failure of M1A Transformer

a. Inspection Scope

On November 28, operating personnel in the control room responded to an automatic load reject scram caused by the failure of the M1A transformer.

The inspectors responded to the control room following the notification of the scram and observed the response of Exelon personnel to the event, including operator actions in the control room. At the time of the event, the inspectors verified that conditions did not meet the entry criteria for an emergency action level (EAL) as described in the Oyster Creek EAL matrix. In addition, the inspectors reviewed 10 CFR 50.72, "Immediate Notification Requirements for Operating Nuclear Power Reactors," to verify that Exelon properly notified the NRC during the event. The inspectors also reviewed TS requirements to ensure that Oyster Creek operated in accordance with its operating license.

The inspectors reviewed PPC data, control room logs, and discussed the event with Exelon personnel to gain an understanding of how operations personnel and plant equipment responded during the event. The inspectors evaluated Exelon's program and process associated with event response to ensure they adequately implemented station procedures OP-AA-108-114, "Post Transient Review" and OP-AA-106-101-1001, "Event Response Guidelines."

The inspectors observed the PORC meeting prior to plant startup to evaluate whether Exelon understood the cause of the event and appropriately resolved issues identified during the event. The inspectors reviewed Exelon's prompt investigation and post-trip review reports, both documented in IR 850348, to gain additional information pertaining to the event, and ensure that human performance and equipment issues were properly evaluated and understood prior to plant startup.

b. Findings

Introduction. An unresolved item was identified to review Exelon's root cause assessment and licensee event report (LER) regarding the failure of the M1A main transformer and subsequent load reject scram to determine whether a performance deficiency existed which contributed to the transformer failure. The inspectors plan to review Exelon's evaluation after it is completed, which had not occurred by the end of this inspection period.

Description. At 2101, November 28, Oyster Creek experienced a generator trip due to an A-phase and B-phase differential relay actuation, which resulted in a reactor shutdown due to a load reject scram. All safety systems operated as expected during the scram. The grid disturbance report provided by Jersey Central Power & Light, combined with information from the Oyster Creek Digital Protective Relay System, differential voltage and current indication data, and dissolved gas in oil analysis indicated that the fault occurred on the B phase of the M1A Main Power Transformer. Exelon entered this issue into their corrective action program in condition report IR 850348. **(URI 05000219/2008005-04: Failure of M1A Transformer Causes an Automatic Load Reject Scram)**

4OA5 Other

.1 Quarterly Resident Inspectors Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors conducted the following observations of security force personnel and activities to ensure that the activities were consistent with Exelon security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal plant working hours and backshift hours. Specifically, the inspectors:

- Observed operations within the central and secondary security alarm stations;
- Toured selected security towers and security officer response posts;
- Observed security force shift turnover activities; and
- Observed security officers on compensatory posts.

These quarterly resident inspectors' observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of inspectors' normal plant status review and inspection activities.

.2 Independent Spent Fuel Storage Installation (ISFSI) Radiological Controls

a. Inspection Scope

The inspectors reviewed operational surveillance data for the ISFSI facility. The inspectors toured the facility and observed and evaluated implementation of radiological controls, including RWPs and postings, and discussed the controls with technicians and supervisory staff. Radiological control activities for ISFSI areas were evaluated against 10 CFR Part(s) 20 and 50, and applicable licensee procedures and Certificate of Compliance.

b. Findings

No findings of significance were identified.

.3 (Closed) URI 05000219/2008004-02. Water with Tritium Identified in Excavation Area within the Protected Area.

The inspectors reviewed Exelon's investigation results associated with the identification, on September 8, of apparent tritium activity in a water puddle collected in an excavation, within the Protected Area, for a new water storage tank. This issue was documented in condition report 815415. Exelon conducted sampling of the water prior to pumping it out. During the review, the inspectors walked down the excavation area, reviewed sample data including groundwater sample analysis results, inter-compared sample results with confirmatory samples, evaluated the likelihood of spillage or leakage, toured the chemistry laboratory, and discussed the results with licensee personnel. This matter was initially reviewed during NRC Inspection 05000219/2008004, dated October 29 and documented as URI 05000219/2008004-02. The inspectors reviewed the circumstances surrounding the identification of the sample, reporting of information, and conformance with the station's TS and associated ODCM.

Exelon developed a comprehensive list of possible causes for the apparent indication of tritium. Exelon concluded that the source of the water in the excavation was from passage of a rain storm. Exelon also concluded the cause of the indication of apparent tritium in the water sample was attributable to an isolated instance of inadvertent cross-contamination of the sample during sample processing within the onsite chemistry laboratory. Exelon's review did not identify any credible means for the water sample, taken from a puddle from within the excavation, to reflect the levels of tritium indicated. Confirmatory sampling and analysis did not identify comparable tritium levels for additional water samples collected from the excavation and water removed from the excavation that had been drummed. Exelon also collected and analyzed groundwater monitoring well water samples, from various wells surrounding the area, and did not identify tritium in these well sample results. Consequently, the review did not identify any credible public or occupational doses associated with the issue. No reporting criteria were identified including reporting under the voluntary industry groundwater

reporting criteria. Exelon suspended analysis of samples, enhanced analysis protocols, and tested the protocols via traceable radioactive standards, prior to resumption of routine analyses. Exelon resumed onsite analysis of tritium samples on November 14. This unresolved item is closed.

b. Findings

No findings of significance were identified.

.4 (Closed) NRC Temporary Instruction (TI) 2515/175, Emergency Response Organization, Drill/Exercise Performance Indicator, Program Review.

a. Inspection Scope

The inspectors performed NRC Temporary Instruction (TI) 2515/175, ensured the completeness of the TI's Attachment 1, and then forwarded that data to NRC, HQ.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

Resident Inspectors Exit Meeting. On January 23, 2009, the inspectors presented the inspection results to Mr. P. Orphanos, Plant Manager, and other members of the Exelon Staff, who acknowledged the conclusions and observations presented. The inspectors confirmed that proprietary information reviewed during the inspection period was returned to Exelon.

Regional Administrator Site Visit. On October 9, a site visit was conducted by Mr. S. Collins, Regional Administrator, for the NRC Region 1 office. During Mr. Collins' visit, he toured the plant and met with Exelon personnel.

Director – Division of Reactor Projects Site Visit. On October 28, a site visit was conducted by Mr. D. Lew, Director of the Division of Reactor Projects for the NRC Region 1 Office. During Mr. Lew's visit, he toured the plant (including a primary containment entry) and met with Exelon personnel.

Executive Director of Operations Site Visit. On December 16, a site visit was conducted by Mr. W. Borchardt, Executive Director of Operations for the Nuclear Regulatory Commission. During Mr. Borchardt's visit, he toured the plant and met with Exelon managers. Mr. D. Lew, Director of the Division of Reactor Projects for the NRC Region 1 office, accompanied Mr. Borchardt on his visit.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as an NCV.

- TS 6.8.1, “Procedures and Programs”, requires that written procedures be established and implemented covering the applicable procedures recommended in Appendix “A” of Regulatory Guide 1.33 as referenced in the Quality Assurance Topical Report (QATR). Regulatory Guide 1.33, Rev.2, as referenced in the QATR, recommends procedures for chemical and radiochemical control including validity of calibration techniques and adequacy of analyses. Contrary to this, the licensee modified its tritium analysis method to achieve an improved environmental lower limit of detection and did not follow its method development process outlined in station procedure CY-AA-130-200, Rev. Section 4.1, for analysis of tritium using the method described in procedure CY-OC-130-530, Rev.4, including completion of Attachment 6 of the procedure. This was identified in the licensee’s corrective action program as IR 832750. This finding is of very low safety significance because it involves the area of environmental monitoring and the radiological environmental monitoring program did not identify unexpected conditions in the environment.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

M. Chandra, Oyster Creek Emergency Preparedness Specialist
J. Dent, Director, Work Management
J. Dostal, Director, Operations
S. Dupont, Regulatory Assurance Specialist
A. Farenga, Oyster Creek Emergency Preparedness Manager
G. Harttraft, ISI Program Manager, Oyster Creek
J. Kandasamy, Manager, Regulatory Assurance
T. Keenan, Manager Security
G. Ludlam, Director, Training
J. Makar, Senior Manager System Engineering
G. McAllister, ANS Manager
M. McAllister NDE Level III Examiner, Oyster Creek
J. McCarthy, Manager, Technical Support
M. McKenna, Shift Operations, Superintendent
J. Murphy, Manager, Radiological Engineer
P. Orphanos, Plant Manager
R. Peak, Director, Engineering
D. Peiffer, Manager Nuclear Oversight
T. Rausch, Site Vice-President
H. Ray, Senior Manager Design Engineering
J. Renda, Manager Radiation Protection
T. Sexsmith, Manager Corrective Action Program
J. Vaccaro, Director, Maintenance
R. Wiebenga, Manager Environmental/Chemistry Manager

Others:
P. Schwartz, State of New Jersey, Bureau of Nuclear Engineering

GE Hitachi Personnel
T. Romano, Inservice Inspection Coordinator

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened/Closed

05000219/2008005-01	NCV	Conduct of Maintenance Procedure Not Properly Implemented (Section 1R12)
05000219/2008005-02	NCV	Core Alterations Performed Without the Required Configuration of Source Range Nuclear Monitors. (Section 1R20)

Opened

05000219/2008005-03	URI	Stack Radiation Monitoring System Sampling Capabilities (Section 4OA2)
05000219/2008005-04	URI	Failure of M1A Transformer Causes an Automatic Load Reject Scram (Section 4OA3)

Closed

05000219/2008004-02	URI	Water with Tritium Identified in Excavation Area within the Protected Area (Section 4OA5)

LIST OF DOCUMENTS REVIEWED

In addition to the documents identified in the body of this report, the inspectors reviewed the following documents and records.

Section 1R01: Adverse Weather Protection

Procedures
OP-OC-108-109-1001, "Preparation for Severe Weather T&RM for Oyster Creek"
OP-AA-108-111-1001, "Severe Weather and Natural Disaster Guidelines"
WC-AA-107, "Seasonal Readiness"
OP-OC-108-1001, "Preparation for Severe Weather T&RN for Oyster Creek"
OP-OC-108-109-1002, "Cold Weather Freeze Inspections"
OP-OC-108-109-1003, "Winter Readiness"
ABN 32, "Abnormal Intake Level"
EP-AA-1010, "Radiological Emergency Plan Annex for Oyster Creek Station"

Work Orders
R2130844 M216809

Condition Reports (IR)
815001 846770 848613 859525 859559 859583

Section 1R04: Equipment Alignment

Procedures
304, Standby Liquid Control System Operation
310, "Containment Spray System Operation"
341, "Emergency Diesel Generator Operation"

Condition Reports (IR)
624925 824421 824420 842685 789733 792279

Other Documents
GE 148F723, Liquid Poison System, Sheet 1
GE 148F740, "Containment Spray System", Sheet 1

Section 1R05: Fire Protection

Procedures
ABN-29, "Plant Fires"
101.2, "Oyster Creek Site Fire Protection Program"
CC-AA-211, "Fire Protection Program"
333, "Plant Fire Protection System"
OP-AA-201-009, "Control of Transient Combustible Material"

Other Documents
OP-OC-201-208 Attachment 1, "Oyster Creek Nuclear Generating Station Pre-Fire Plan – Reactor Building (-19' Elevation) CRD Pump Room (RB-FZ-1F3)
OP-OC-201-208 Attachment 1, "Oyster Creek Nuclear Generating Station Pre-Fire Plan – Reactor Building (-19' Elevation) Northeast Corner Room (RB-FZ-1F4)
OP-OC-201-208 Attachment 1, "Oyster Creek Nuclear Generating Station Pre-Fire Plan – MG Set Room (OB-FZ-8A)
OP-OC-201-208 Attachment 1, "Oyster Creek Nuclear Generating Station Pre-Fire Plan – Main Transformer Area (MT-FA-12)
990-1746, "Oyster Creek Nuclear Generating Station Fire Hazards Analysis Report"

Section 1R07: Heat Sink Performance

Procedures
607.4.005, "Containment Spray and Emergency Service Water Pump System 2 Operability and Comprehensive/Preservice/Post-Maintenance Inservice Test"

Condition Reports (IR)
A0703678

Other Documents
Calculation C-1302-241-E120-085
UFSAR Section 6.22, "Containment Heat Removal Systems"
UFSAR Table 6.2-7, "Containment Spray Heat Exchangers"
UFSAR Table 6.2-15, "Containment Response to Minimum Containment Spray and Emergency Service Water System Flows"

Section 1R08: In-Service Inspection

NDT Examination Reports
Liquid Penetrant Examination Report APR-003, Sheet PT-002, weld NR02 2-565C (N2C) Recirc Safe End to Nozzle, completed 11/1/2008
Automated Ultrasonic Testing Data/Scan Parameter Sheet, APR-003, weld NR02 2-565C (N2C) Recirc Safe End to Nozzle, Sheets APD-003, APD-004, and APD-005, completed 11/5/2008
Liquid Penetrant Examination Report APR-004, Sheet PT-001, weld NR02 1-567A (N6A) Core Spray Safe End to Nozzle, completed 11/1/2008
Automated Ultrasonic Testing Data/Scan Parameter Sheet, APR-004, weld NR02 1-567A (N6A) Core Spray Safe End to Nozzle, Sheets APD-001 and APD-002, completed 11/3/2008
Manual UT Examination Report Number OC1R22-149, Sheets D-024, D-025, and D-026, Pipe to Valve V-20-0015, Weld NZ-3-0004, completed 10/30/2008

Manual UT Examination Report Number OC1R22-081, Sheet D-052, Elbow to Pipe Weld ND-1-0004, completed 11/3/2008
Manual UT Examination Report Number OC1R22-084, Sheet D-050, Pipe to Pipe Weld ND-1-0004C, completed 11/3/2008
Manual UT Examination Report Number OC1R22-080, Sheet D-047, Pipe to Elbow Weld ND-1-0003, completed 11/3/2008
Manual UT Examination Report Number OC1R22-082, Sheet D-048 and D-049, Pipe to Valve V-16-0133, Weld ND-1-0004A, completed 11/3/2008
Manual UT Examination Report Number OC1R22-083, Sheet D-053 and D-054, Valve V-16-0133 to Pipe Weld ND-1-0004B, completed 11/3/2008
UT Examination Summary Sheet Number APR-001, NR02 4-565A (N1A) Recirc Outlet Nozzle to Safe End, 11/18/08, 30 pages

Engineering Technical Evaluations
AT 00842492, Engineering Evaluation for the Acceptability of UT Indication in weld NR02 4-565A, 11/14/08
Document Number AM-2008-020, Revision 0, 11/13/08, Oyster Creek Reactor Recirculation Nozzle N1A Degradation Mechanism Review
Structural Integrity Associates Calculation File No. 0801457.301, Flaw Evaluation of Oyster Creek N1A Suction (RPV Outlet) Nozzle-to-Safe End Weld, Revision 3, 11/12/08

Repair/Replacement
Work Order C2012002, Replacement of Shutdown Cooling Loop ‘C’ Outlet Isolation Motor Operated Valve V-17-57, Form NIS-2, dated 2/8/2007
Magnetic Particle Testing Examination Data Record 1R21-240, completed 11/5/2006
Magnetic Particle Testing Examination Data Record 1R21-241, completed 11/5/2006
Ultrasonic Testing Examination Sheet 1R21-240, NU-2-17-X, Elbow to Valve Weld, Data Sheet D-314 and D-316, completed 11/5/2006
Ultrasonic Testing Examination Sheet 1R21-241, NU-2-18-X, Valve to Pipe Weld, Data Sheet D-317, D-318, and D-319, completed 11/5/2006

Procedures
ER-AA-330, Conduct of In-service Inspection Activities, Rev. 7
ER-AA-330-001, Section XI Pressure Testing, Rev. 8
ER-AA-330-002, In-service Inspection of Section XI Welds and Components, Rev. 7
ER-AA-330-009, ASME Section XI Repair/Replacement Program, Rev. 5
ER-OC-330-1001, ISI Program Plan Document, Fourth Ten-Year Inspection Interval, Oyster Creek Generating Station, Rev. 5
ER-OC-330-1002, IGSCC Inspection Program, Fourth 10-Year Inspection Interval, Rev. 2

Other Documents
Surveillance and Test Program Audit NOSA-OYS-08-07 Oyster Creek September 22, 2008 to October 3, 2008
Program Health Report Oyster Creek Inservice Inspection (ISI) Program, 3rd Quarter 2008
RPV and Internals Program (IVVI)/BWRVIP) Oyster Creek Generating Station ER-AB-331, 3rd Quarter 2008
ASME Code Case N-568 Alternative Examination Requirements for Class 1, 2 and 3 Piping, Components and Supports
EPRI Evaluation of Dissimilar Metal Weld Examinations Performed at Oyster Creek during Refueling Outage 22 (1R22), IR-2008-340, dated 11/2008

IRs
550305 744982 836642 842492

Section 1R11: Licensed Operator Requalification Program

Procedures
ABN-1, “Reactor Scram”
ABN-40, “Stuck Open EMRV”
EMG-3200.01B, “RPV Control w/ ATWS”
Support Procedure 16, “Bypassing MSIV Lo-Lo Level Isolation Interlocks and the RBCCW Interlocks”
Support Procedure 17, “Termination and Prevention of Injection”
Support Procedure 25, “Initiation of Containment Spray System in the Torus Cooling Mode”

Other Documents
EOP User’s Guide (2000-BAS-3200.02)

Section 1R12: Maintenance Effectiveness

Procedures
ER-AA-310, “Implementation of Maintenance Rule”
ER-AA-310-1005, “Maintenance Rule - Disposition Between (a)(1) and (a)(2)”
LS-AA-125-1003, “Apparent Cause Evaluation Manual”
MA-AA-1000, “Conduct of Maintenance Manual”

Condition Reports (IR)
848586 842131

Work Order
R2094262

Other Documents
NEI 93-01, “Industry Guideline for monitoring the Effectiveness of Maintenance at Nuclear Power Plants”

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures
ER-AA-600-1042, “On-line Risk Management”
ER-AA-600-1021, “Risk Management Application Methodologies”
ER-AA-600-1014, “Risk Management Configuration Control”
ER-AA-600-1011, “Risk Management Program”
WC-OC-101-1001, “On-line Risk Management and Assessment”
334, “Instrument and Service Air System”
309.1, “Turbine Building Closed Cooling Water”

Condition Report (IR)
857633 860216

Other Documents
EXOC011-CALC-001, “Isolation Condenser Heat Capacity”

Section 1R15: Operability Evaluations

Procedures
OP-AA-108-115, "Operability Determination"
209.95.0, "Reactor Flood-up/Drain-down"

Drawings
GE 148F444, "Cleanup Demineralizer System Flow Diagram"

Condition Reports (IR)
836518 841602 850390

Other Documents
NRC Inspection Manual - Part 9900 Technical Guidance, "Operability Determinations & Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety
Oyster Creek Nuclear Generating Station Operations Plant Manual Figure 55-1: "Cold Reference Leg Level Instrument"
Oyster Creek Nuclear Generating Station Operations Plant Manual Figure 55-4: Reactor Water Level Instrument Ranges"
2611-PGD-2621, Nuclear Plant Operator Training Module "RX Vessel Instrumentation"
Technical Specifications 3.D.9, "Refueling"
UFSAR Table 7.6-1, "Summary of Reactor Vessel Water Level Instruments"
RO/STA 98-1, Lesson Plan: "Vessel Instruments – Level"

Section 1R18: Plant Modifications

Procedures
CC-AA-103, "Configuration Change Control for Permanent, Physical Plant Changes"
665.5.006, "Local Leak Rate Tests"
CC-AA-112, "Temporary Configuration Changes"
CC-MA-112-1001, "Temporary Configuration Change Packages (TCCP)"
LS-AA-104-1000, "Exelon 50.59 Resource Manual"
LS-AA-104, "Exelon 50.59 Review Process"

Work Order (AR)
A2184770 A217646

Other Documents
ATI 841005-02
ECR 08-1004, "Replacement of check valve V-5-165 due to LLRT failure"
OC-2008-S-0170, 50:59 Screening: "CRD Pump Filter Tie In"

Section 1R19: Post-Maintenance Testing

Procedures
MA-AA-716-012, "Post Maintenance Testing"
OP-MA-109-101, "Clearance and Tagging"
607.4.004, "Containment Spray and Emergency Service Water Pump System 1 Operability and Comprehensive/Preservice/Post-Maintenance Inservice Test", dated October 16, 2008

617.4.003, “Control Rod Scram Insertion Time Test and Valve IST Test”, dated December 12, 2008
2400-GMM-3225.52, “Control Rod Drive Hydraulic Control Unit”
MA-AA-716-008, “Foreign Material Exclusion”
645.6.011, “Deluge and Sprinkler System Inspection”
645.6.010, “Fire Protection Deluge Valve Functional Test”
101.2, “Fire Protection Program”

Condition Report (IR)

831507	831503	831491	832013	834399	833488

Work Order

R2120883	R2060728	C2017578	A2008192	C2002155	A2184770
R2126593					

Other Documents
VM-OC-0226, “Hydraulic Control Unit (237E18G1-G5)”

Section 1R20: Refueling and Outage Activities

Procedures
201, "Plant Startup"
203, “Plant Shutdown”
205.0, “Reactor Refueling”
205.94.0 “Reactor Pressure Vessel Flood-Up Using Core Spray”
205.95.0, “Reactor Flood-up / Drain-Down”
305, “Shutdown Cooling System Operation”
306, “Reactor Vessel Head Cooling System Operation”
OP-AA-108-108, “Unit Restart Review”
OP-AA-108-1001, “Drywell/Containment Closeout”

Condition Report (IR)

844470	845597	840457	830890	836125	841602
842349	837767	845240	845553	845402	844348
853928	768064	840425	845710	845890	845699
835930	835929	836622	846752	846750	846456
846784	846785	846829	846873	846881	846719
846761	846278	846729	846267	846248	846246
846209	846237	846240	842544	836613	837464
837868	836642	836622	836664	836125	835982
837057	844763	839088	703097	840560	837797
838342	838369	848547	848788	848783	848754
848723	848662	848586	848077	768233	843243
843244	843433	843349	835027	835031	832616
833992					

Other Documents
NF-AA-310, Fuel Move Sheet “1R22 Load SRM 21”
NF-AA-310, Fuel Move Sheet “1R22 Reload 2A5 Contingency Part 1”
Technical Specifications 3.9.D, “Refueling”
Technical Specification 3.5.B, “Secondary Containment”

Oyster Creek Generating Station 1R22 Refueling Outage Shutdown Safety Plan, dated October 9, 2008

Section 1R22: Surveillance Testing

Procedures
SA-AA-129, "Electrical Safety"
MA-AA-1000, "Conduct of Maintenance"
665.5.006, "Local Leak Rate Tests"
636.4.001, "No. 1 Diesel Generator Automatic Actuation Test"
612.4.001, "Standby Liquid Control Pump and Valve Operability and In-Service Test"
341, "Emergency Diesel Generator Operation"
304, "Standby Liquid Control Operation"

Condition Reports (IR)

827682	833194	839492	839552	839293	827682
824420	824421				

Work Orders (AR)

R2095488	A2156628	A2203632	C2015162

Other Documents
NRC Inspection Manual Part 9900 Technical Guidance, "Maintenance- Preconditioning of Structures, Systems, and Components Before Determining Operability"
ECD C 208466
GL 96-01 "Testing of Safety-Related Logic Circuits"

Section 1EP2: Alert and Notification System (ANS) Evaluation

Other Documents
Nuclear Standardized Radiological Emergency Plan, EP-AA-1000, Rev. 19
Nuclear Radiological Emergency Plan Annex for Oyster Creek Station, EP-AA-1010, Rev. 1
Oyster Creek Nuclear Plant Upgraded Public Alert and Notification System Report, March 2005
East Alert Notification System Program, EP-MA-121-1002, Rev. 5
East ANS Preventive Maintenance Program, EP-MA-121-1005, Rev. 3
East ANS Siren Monitoring, Troubleshooting, and Testing, EP-MA-121-1006, Rev.5
Maintenance and testing records for February 2007 – September 2008

Section 1EP3: Emergency Response Organization (ERO) Staffing and Augmentation System

Condition Reports (IR)

697247	708924	807768	817140	752173	706900
619806	682808	676706	697251	817103	819611
790610	790590	697250	807477		

Other Documents
ERO Training and Qualification, TQ-AA-113, Rev. 12
Mid-Atlantic ERO Notification or Augmentation, EP-AA-112-100-F-07, Rev. E
ERO Fundamentals, EP-AA-1102, Rev. 5

ERO Augmentation drill results for March 2007 – September 2008
ERO call-in augmentation drill results for April 2007 – September 2008
ERO roster and drive times
ERO training module plans (sampling)

Section 1EP4: Emergency Action Level (EAL) and Emergency Plan Changes

Condition Reports (IR)
581301

Other Documents
Standardized Radiological Emergency Plan 07-82, Rev. 0
Emergency Plan for Oyster Creek Station 07-83, Rev. 0
Radiological E Plan Annex for Oyster Creek 08-14, Rev. 1

Section 1EP5: Correction of Emergency Preparedness Weaknesses

Condition Reports (IR)

767502	767277	622256	664768	675307	593516
609972	703429	699926			

Other Documents
FASA Self-Assessment Report – Emergency Preparedness, 7-23-08
Emergency Preparedness Audit NOSA-OYS-08-03, Oyster Creek, 4-30-08
Check-In Self-Assessment Report – Emergency Preparedness, 4-18-08
Emergency Preparedness Audit NOSA-OYS-07-04, Oyster Creek, 5-2-07
Drill reports 1st quarter 2007 – 3rd quarter 2008

Section 2OS1: Access Control to Radiological Significant Areas

Other Documents
Annual Radiological Operating Report, 2007
Monthly, Quarterly, and Cumulative Effluent Dose reports (October 2007 to present)
Horizontal Storage Module Temperature Profiles
Module Temperature Monitoring Data and Results
IFSI 10 CFR 72.212 Evaluation

Section 2OS2: ALARA Planning and Controls

Other Documents
ALARA Work in Progress Reviews and Post-Job Interviews
Outage ALARA Plan Results Tracking Data
Bioassay Results and Intake Investigation Results - various

Section 2SO3: Radiation Monitoring Instrumentation and Protective Equipment

Other Documents
Outage Air Sample Results, 1R22
Electronic Dosimeter Alarm Response forms - various

Section 4OA1: Performance Indicator Verification

Other Documents
Oyster Creek Limiting Condition for Operation (LCO) Log, 12/1/2007 through 11/30/2008
Oyster Creek Out of Service (OOS) Log, 12/1/2007 through 11/30/2008
Oyster Creek Operations Narrative Log, 12/1/2007 through 11/30/2008
Oyster Creek Corrective Action Program Log, 12/1/2007 through 11/30/2008
ER-AA-2008, Mitigating Systems Performance Index (MSPI) Failure Determination Evaluation
ER-AA-600-1047, Mitigating Systems Performance Index Basis Document
NEI 99-02 Rev 5, Regulatory Assessment Performance Indicator Guideline
OC-2006-01, Oyster Creek MSPI Basis Document

Section 4OA2: Identification and Resolution of Problems

Procedures
OP-AA-102-103, "Operator Work-Around Program"
OP-AA-108-101, "Control of Equipment and System Status"

Condition Reports (IR)

833493	846045	833858	835952	835982	842358
840233	854727	854814	854818	832749	832750
832753	832745	832755	835816	835817	836134
837169	838391	838394	838756	839590	853405
838691	854727	840233			

Work Orders (AR)
A833493

Section 4OA3: Event Followup

Procedures
645.6.013, "Fire Suppression System Halon Functional Test"
ABN-29, "Plant Fires"
ABN-48, "Loss of USS 1B2"
OP-OC-201-008, "Oyster Creek Nuclear Generating Station Pre-Fire Plan"
LS-AA-106, "Plant Operations Review Committee"
OP-AA-108-108, "Unit Restart Review"
602.3.014, "EMRV Pressure Sensor/Pilot Valve Control Relay – Test and Calibrate (PS-IA0083)"
602.3.004, "Electromatic Relief Valve Pressure Sensor Test and Calibration"
OP-AA-108-114, "Post Transient Review"
CC-AA-5001, "Post Transient or SCRAM Walkdown"

Condition Reports (IR)

842102	842131	857308	857399	850585	850391
850395	850348	850838	850841	850856	851022
851040	852390	851906	850613	850390	842259
839150	768233	835031	835027	835031	

Other Documents
NUREG-1022, “Event Reporting Guidelines 10 CFR 50.72 and 50.73"
Event Notice 44688, “Automatic Reactor Scram Due to Main Transformer Fault”
Exelon Letter, “Oyster Creek Nuclear Generating Station; NJPDES Permit NJ0005550 5-Day Follow-up Report and Assertion of Affirmative Defense under NJ Administrative Code and NJ Statues, Incident Identification Number 297279, Communications Center Number 08-11-29-0009-48”, dated December 3, 2008
C-1302-622-E510-060, “PS-IA-0083 EMRV High Pressure Relief Calibration and Instrument Loop Error”, Rev. 0
NUREG-0737, “Clarification of TMI Action Plan Requirements”
GPU Nuclear Corporation Letter, “Technical Specification Change Request (TSCR) No. 216. RE: LIMITING SAFETY SYSTEM SETTINGS; Technical Specification 2.3.D, “Reactor High Pressure, Relief Valve Initiation” Limiting Safety System Setpoint Change”, dated June 15, 1994
Topical Report 101, “Considerations Associated with Changing Electromatic Relief Valve (EMRV) Setpoints”, Rev. 0
ES0800016, “OPL-3 Parameters for Oyster Creek Unit 1 Cycle 22”

LIST OF ACRONYMS

ABN	Abnormal Procedure
ADAMS	Agency-wide Documents Access and Management System
ALARA	As Low As Reasonably Achievable
ANS	Alert and Notification System
ASME	American Society of Mechanical Engineers
ATWS	Anticipated Transient Without Scram
BWR	Boiling Water Reactor
CEDE	Committed Effective Dose Equivalent
CFR	Code of Federal Regulations
CRD	Control Rod Drive
EAL	Emergency Action Level
ED	Electronic Dosimeter
EMRV	Electromatic Relief Valve
EPRI	Electric Power Research Institute
ERO	Emergency Response Organization
Exelon	Exelon Energy Company, LLC
GE	General Electric
GEMAC	General Electric Measurement and Control
HRA	High Radiation Area
IGSCC	Intergranular stress corrosion cracking
IR	Issue or Condition Report
ISI	In-service Inspection
IMC	Inspection Manual Chapter
IVVI	In-vessel visual inspection
LDE	Lens Dose Equivalent
LER	License Event Report
LLC	Limited Liability Company
LLRT	Local Leak Rate Test
MAC	Monitoring and Control Facility
MCC	Motor Control Center

MSIP	Mechanical stress improvement process
MSPI	Mitigating Systems Performance Index
NEI	Nuclear Energy Institute
NCV	Non-cited Violation
NDE	Non-destructive examination
NRC	Nuclear Regulatory Commission
NUREG	NRC Technical Report Designation
ODCM	Offsite Dose Calculation Manual
OE	Operating experience
OWA	Operator Workarounds
Oyster Creek	Oyster Creek Generating Station
PI	Performance Indicator
PORC	Plant Onsite Review Committee
PPC	Process Plant Computer
PT	Dye Penetrant Test
PWR	Pressurized Water Reactor
QATR	Quality Assurance Topical Report
RCS	Reactor Coolant System
RWP	Radiological Work Permit
SDC	Shutdown Cooling
SDE	Shallow Dose Equivalent
SDP	Significance Determination Process
SIA	Structural Integrity Associates
STAR	Stop, Think, Act, Review
SRM	Source Range Monitor
TEDE	Total Effective Dose Equivalent
TI	Temporary Instruction
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VAC	Voltage, Alternating Current
VHRA	Very High Radiation Area
VT	Visual Test