



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

July 31, 2008

Mr. Charles G. Pardee
Chief Nuclear Officer (CNO) and Senior Vice President
Exelon Generation Company, LLC
Chief Nuclear Officer (CNO)
AmerGen Energy Company, LLC
200 Exelon Way
Kennett Square, PA 19348

**SUBJECT: OYSTER CREEK GENERATING STATION - NRC INTEGRATED INSPECTION
REPORT 05000219/2008003**

Dear Mr. Pardee:

On June 30, 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 July 18, 2008, with Mr. J. Randich, 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 three self revealing findings of very low safety significance (Green). One of these findings was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because it was entered into your corrective action program, the NRC is treating this one finding as a non-cited violation (NCV) consistent with Section VI.A of the NRC's Enforcement Policy. If you contest this NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Oyster Creek.

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C. Pardee

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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 05000219/2008003
w/Attachment: Supplemental Information

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C. Pardee

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U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.: 50-219

License No.: DPR-16

Report No.: 05000219/2008003

Licensee: AmerGen Energy Company, LLC (AmerGen)

Facility: Oyster Creek Generating Station

Location: Forked River, New Jersey

Dates: April 1, 2008 – June 30, 2008

Inspectors: M. Ferdas, Senior Resident Inspector
J. Kulp, Resident Inspector
O. Ayegbusi, Resident Inspector (Acting)
J. Schoppy, Senior Reactor Inspector
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Approved By: Ronald R. Bellamy, Ph.D., Chief
Projects Branch 6
Division of Reactor Projects

Enclosure

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SUMMARY OF FINDINGS

IR 05000219/2008003; 04/01/2008 - 06/30/2008; AmerGen Energy Company, LLC (AmerGen), Oyster Creek Generating Station (Oyster Creek); Maintenance Effectiveness, Surveillance Testing, and Identification and Resolution of Problems.

The report covered a 3-month period of inspection by resident inspectors, a project engineer, regional reactor inspectors, and an announced inspection by health physicists. One Green non-cited violation (NCV) and three Green findings (FIN) 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 Event

Green. A self-revealing finding was identified when AmerGen improperly reassembled the inlet valve actuator on the 'C & D' instrument air dryers which damaged its o-ring and subsequently resulted in an instrument air transient on March 24, 2008. This finding was determined not to be a violation of NRC requirements. AmerGen's corrective actions included repairing the air dryer inlet valve by replacing the failed o-ring and providing training on o-ring installation to maintenance personnel.

The finding was more than minor because it was associated with the equipment performance attribute of the initiating events cornerstone and affected the objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. In accordance with inspection manual chapter (IMC) 0609.04, "Phase 1 – Initial Screen and Characterization of Findings," the inspectors conducted a Phase 1 SDP screening and determined that a detailed Phase 2 evaluation was required to assess the safety significance because the finding contributed to both the likelihood of a reactor trip and the likelihood that mitigation equipment would not be available. The finding was determined to be of very low safety significance based upon the Phase 2 evaluation. The performance deficiency had a cross-cutting aspect in the area of human performance because training was not adequate to ensure proper reassembly of the valve actuator by maintenance personnel [H.2(b)]. (Section 1R12)

Green. A self-revealing finding occurred when the suction air filters to the '1-1' and '1-2' service air compressors became clogged with debris which affected the availability and reliability of the compressors on April 25, 2008. In 2001, AmerGen implemented a modification which involved replacing the service air compressors. During the modification process, AmerGen removed preventive maintenance tasks for the suction air filters without adequate technical justification. AmerGen's corrective actions included replacing the inlet air filters, taking action to create Preventive Maintenance (PM) to inspect/replace the air filters and reviewing the extent of condition with respect to similar plant modifications. This finding was of very low safety significance and determined not to be a violation of NRC requirements.

The finding was more than minor because it was associated with the equipment 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. The finding was assessed in accordance with IMC 0609.04, "Phase 1 – Initial Screen and Characterization of Findings." The inspectors performed a Phase 1 screening and determined that a Phase 2 evaluation was required to assess safety significance because the finding contributed to both the likelihood of a reactor trip and the likelihood that mitigation equipment would not be available. A Region 1 senior reactor analyst (SRA) determined that a Phase 2 evaluation was not suited to assess this event. A Phase 3 analysis was performed by the SRA and the finding was determined to be of very low safety significance. The inspectors did not identify a cross cutting aspect for this finding because the performance deficiency had occurred several years ago and is not indicative of current performance.

Cornerstone: Mitigating Systems

Green. The inspectors identified that AmerGen had scheduled surveillance tests in a sequence that would have resulted in unacceptable preconditioning of valves within the core spray system on May 19, 2008. This finding was determined not to be a violation of NRC requirements. AmerGen's corrective actions involved reordering the scheduling sequence of the tests and reviewing upcoming (next 60 days) work control schedules to identify potential preconditioning.

The finding was more than minor because it was associated with the equipment performance attribute of the mitigating systems cornerstone and affected the objective to ensure the reliability and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, preconditioning of valves could mask their actual as-found condition and result in an inability to verify their operability, as well as make it difficult to determine whether the valves would perform their intended safety function during an event. In accordance with IMC 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance because it was not a design or qualification deficiency which resulted in a loss of operability or functionality, did not represent a loss of system safety function, did not represent an actual loss of safety function of a single train for greater than its technical specification allowed outage time, did not represent an actual loss of safety function of one or more non-technical specification trains of equipment designated as risk-significant for greater than 24 hours, and was not potentially risk significant due to a seismic, flooding or severe weather initiating event. The performance deficiency had a cross-cutting aspect in the area of human performance because AmerGen did not appropriately coordinate work activities to support long term equipment reliability [H.3(b)]. (Section 1R22)

Green. A self revealing finding occurred when AmerGen did not properly implement a functional test procedure for the '1-1' diesel driven fire pump on November 7, 2007. Specifically, operations personnel did not accurately measure the speed of the pump while performing the functional test, which resulted in the pump being declared inoperable and unavailable for greater than three weeks during troubleshooting by AmerGen personnel. This finding was of very low safety significance and determined to be a non-cited violation (NCV) of technical specification 6.8, "Procedures and Programs." AmerGen's corrective actions included providing additional training to operators to accurately monitor speed of the diesel with a stroboscope and revising the procedure to include vendor guidance for measuring diesel speed.

The finding was more than minor because it was associated with the equipment performance attribute of the mitigating systems cornerstone and affected the objective to ensure the availability and reliability of systems that respond to initiating events to prevent undesirable consequences. In accordance with IMC 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the inspectors conducted a Phase I SDP screening and determined that the finding was of very low safety significance (Green). The finding was of low safety significance because there was no loss of safety function due to the availability of the redundant diesel driven fire pump. The inspectors also reviewed this issue in accordance with IMC 0609, Appendix F, "Fire Protection Significance Determination Process," to confirm the above results. The finding was determined to be of very low safety significance (green) because it was assigned a low degradation rating due to availability of other fire protection pumps. The performance deficiency had a cross-cutting aspect in the area of human performance because training was not adequate to ensure the proper use of the stroboscope by operations personnel during testing [H.2 (b)]. (Section 4OA2)

B. Licensee-Identified Violations

None.

REPORT DETAILS

Summary of Plant Status

The Oyster Creek Generating Station (Oyster Creek) began the inspection period operating at 92% power. In December 2007, AmerGen determined that Oyster Creek would operate at reduced power for an extended period of time until troubleshooting and maintenance to the turbine control valve system could be completed. Additional information on this is contained in NRC inspection report 05000219/2007005, dated January 25, 2008.

On April 25, 2008, operators commenced a shutdown in accordance with operating procedures to support a planned maintenance outage. During the shutdown, AmerGen identified that the main steam #2 moisture separator reheater supply valve (V-1-34) would not close remotely and could not be closed manually because the valve had a steam leak. This required AmerGen to change their shutdown plan (manually inserting each control rod per their shutdown procedure) and subsequent shutdown by a manual reactor scram. AmerGen determined that a manual reactor scram from greater than 130 MWe (20% power) would be necessary in order to avoid an automatic turbine trip and subsequent reactor scram due to excessive shell to tube differential temperature that would occur on the second stage reheaters with the supply valve not shut. Prior to performing this activity, AmerGen performed several management meetings to discuss their options and provided simulator training to the operations personnel involved with performing the shutdown. On April 26, 2008, AmerGen performed a manual reactor scram from 171 MWe (31% power). During the planned maintenance outage, AmerGen performed maintenance on the turbine control valve system, 'A' main feedwater regulating valve, feedwater heater level control valves, and performed other minor and preventive maintenance. Operators established the reactor critical on April 28, 2008 and synchronized the main generator to the grid on April 29, 2008. The plant reached full power on April 30, 2008.

On May 20, 2008, operators performed a planned downpower to 85% to perform control rod scram time testing on control rods '26-35' and '30-35' and to withdraw control rod '38-43' after the completion of maintenance. The plant returned to full power on May 20, 2008.

On May 27, 2008, operators performed a planned downpower to 92% to investigate the 'A' north main condenser backwash valve ('V-3-18') which was not completely opening. The plant returned to full power on May 27, 2008. On May 30, 2008, operators performed another planned downpower (to 80%) in order to perform internal inspections and repairs on the valve. The plant returned to full power on May 31, 2008.

On June 6, 2008, operators performed a planned downpower to 90% to perform a rod pattern adjustment. The plant returned to full power on June 6, 2008.

On June 20, 2008, operators performed a planned downpower to 80% to perform a rod pattern adjustment. The plant returned to full power on June 22, 2008.

Oyster Creek operated at 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 (3 samples)

The inspectors performed one offsite power readiness review, one adverse weather preparation, and one site specific weather-related condition inspection.

The inspectors evaluated AmerGen's readiness to handle issues that could impact offsite and alternating current (AC) power systems. The inspectors reviewed AmerGen's procedures and programs which discussed the operation and availability/reliability of offsite and alternate AC power systems during adverse weather. The inspectors verified that communication protocols between the transmission system operator and AmerGen existed; and the appropriate information would be conveyed when potential grid stress and disturbances existed. The inspectors also verified that AmerGen's procedures contained actions to monitor and maintain the availability/reliability of offsite and onsite power systems prior to and during adverse weather conditions.

The inspectors reviewed AmerGen's activities associated with seasonal readiness for hot weather conditions. The inspectors reviewed the updated final safety analysis report (UFSAR) for Oyster Creek to identify risk significant systems that require protection from hot weather conditions. The inspectors assessed the readiness of the reactor building closed cooling water (RBCCW), turbine building heating ventilation and cooling, and service water systems to seasonal susceptibilities due to hot weather. The inspectors performed a walkdown of the intake structure, feed pump room and reactor building. The inspectors reviewed AmerGen's hot weather preparation activities to assess their adequacy and to verify they were completed in accordance with procedural requirements. The inspectors also reviewed applicable corrective action program condition reports to assess their reliability and material condition of these systems.

The inspectors also reviewed AmerGen's response to the declaration of a tornado watch on June 4, 2008. The inspectors verified that AmerGen personnel effectively implemented abnormal procedure (ABN)-31, "High Winds," and procedure OP-OC-108-109-1001, "Severe Weather Preparation Training & Reference Manual (T&RM) for Oyster Creek." The inspectors performed a walkdown of areas that could be potentially impacted by high wind conditions, such as the intake structure, diesel generator structure, and transformers (main, auxiliary, and startup).

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 (71111.04S - 1 sample; 71111.04Q – 3 samples)

The inspectors performed one complete and three partial equipment alignment inspections. The partial equipment alignment inspections were completed during conditions when the equipment was of increased safety significance 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:

- # 1 service water system on April 8, 2008;
- #2 containment spray system on April 14, 2008; and
- Standby liquid control (SLC) system on June 13, 2008.

The inspectors also performed a complete system alignment inspection on the fire protection system to determine whether the system was aligned and capable of performing its design function to detect fires and supply fire suppression. In addition, the inspectors independently verified that the fire protection system was aligned to provide a backup water supply to the core spray system, condensate storage tank, and isolation condensers (IC). The inspectors reviewed selected procedures, piping and instrumentation drawings, testing results, and the applicable equipment lineup list; and interviewed the system engineer. The inspectors also reviewed corrective action program condition reports documenting fire protection system deficiencies to verify identified problems were being evaluated and corrected.

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 walk down of four plant areas to assess their vulnerability to fire. During plant walk downs, the inspectors observed combustible material control measures, fire detection and suppression equipment availability, visible fire barrier configuration, and the adequacy of compensatory measures (when applicable). The inspectors reviewed “Oyster Creek’s 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. The following plant areas were inspected:

- 'B' 480V room on April 9, 2008;
- '1-3' and '1-4' containment spray pump room (southeast corner room) on April 16, 2008;
- '1-1' and '1-2' containment spray pump room (northeast corner room) on April 17, 2008; and
- Turbine building feed pump room on June 9, 2008.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

a. Inspection Scope (1 sample)

The inspectors observed one simulator training scenario to assess operator performance and training effectiveness on April 23, 2008. The scenario involved a control rod drift alarm, a rise in unidentified leakage, and a failure to scram event (anticipated transient without scram.) The inspectors assessed whether the simulator adequately reflected the expected plant's response, operator performance met AmerGen'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 (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 by AmerGen:

- 'C/D' air dryer inlet valve actuator failure on March 24, 2008 (IR 754755); and
- Clogging of the '1-1' and '1-2' service air compressor suction filters on April 25, 2008 (IR 767545).

The inspectors verified that the systems or components were being monitored in accordance with AmerGen's maintenance rule program requirements. The inspectors compared documented functional failure determinations and unavailable hours to those being tracked by AmerGen. The inspectors reviewed completed maintenance work orders and procedures to determine if inadequate maintenance practices contributed to the equipment performance issues. The inspectors also reviewed corrective action program condition reports, operator narrative logs, and vendor manuals. Documents reviewed for this inspection activity are listed in the Supplemental Information attachment to this report.

b. Findings

There were two Green, self revealing findings (FIN) identified.

.1 Improper Reassembly of Air Dryer Inlet Valve Results in an Instrument Air Transient

Introduction: A self-revealing finding was identified when AmerGen improperly reassembled the inlet valve actuator on the 'C & D' instrument air dryers which damaged its o-ring and subsequently resulted in an instrument air transient on March 24, 2008. This finding was of very low safety significance (Green) and determined not to be a violation of NRC requirements. AmerGen's corrective actions included repairing the air dryer inlet valve by replacing the failed o-ring and providing training on o-ring installation to maintenance personnel.

Description: On March 23, 2008, AmerGen personnel identified that instrument air pressure was lower than normal (IR 753495) and commenced system walk downs to identify the source of the air leakage. Operations personnel identified that a low point drain trap valve was leaking air (IR 753488). Operations personnel isolated the drain trap and instrument air pressure improved slightly (but was still lower than normal values). Additional walk downs by AmerGen personnel identified a broken air line in the condenser bay to a feedwater heater control valve (IR 753585).

On March 24, 2008, operations personnel received unexpected instrument air dryer and service air pressure low alarms accompanied by a drop in instrument air pressure. Operators implemented annunciator response procedures (RAP) for the low instrument air pressure and air dryer failure, and implemented ABN-35, "Loss of Instrument Air." The standby air compressor started as designed and instrument air pressure remained steady at 86 PSIG. No malfunctions of any air operated control systems were noted. Operations personnel identified that the inlet valve for the 'C & D' instrument air dryer had failed in mid-stroke and was leaking air from the valve actuator. The 'A & B' instrument air dryer was placed in service and 'C & D' instrument air dryer was isolated, which terminated the leak and allowed system pressure to be reestablished.

AmerGen performed an evaluation (IR 754755) and determined that the leak was a result of a failed actuator cover o-ring that was damaged due to an installation error when the valve was refurbished (WO R2099991) on February 29, 2008. The valve was repaired (WO C2017285) and the 'C & D' instrument air dryer was returned to service on March 25.

The performance deficiency associated with this self-revealing finding involved improper reassembly of the inlet valve actuator. The improper reassembly resulted in a failure of the actuator valve cover o-ring and a subsequent pressure transient in the instrument air system on March 24, 2008. AmerGen's corrective actions included repairing the air dryer inlet valve by replacing the failed o-ring and providing training on o-ring installation to maintenance personnel.

Analysis: The finding was more than minor because it was associated with the equipment performance attribute of the initiating events cornerstone and affected the objective to limit the likelihood of those events that upset plant stability and challenge

critical safety functions during power operation. In accordance with inspection manual chapter (IMC) 0609.04, "Phase 1 – Initial Screen and Characterization of Findings," the inspectors conducted a Phase 1 SDP screening and determined that a detailed Phase 2 evaluation was required to assess the safety significance because the finding contributed to both the likelihood of a reactor trip and the likelihood that mitigation equipment would not be available.

A Phase 2 evaluation was conducted using IMC 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations," and the "Risk-Informed Inspection Notebook for Oyster Creek Nuclear Generating Station," Revision 2.01A. The inspectors made the following assumptions:

- The 'C & D' instrument air dryer was unavailable for a total of 24 hours. Therefore, an exposure time of less than 3 days was used to identify the Initiating Event Likelihood per Table 1, "Categories of Initiating Events for Oyster Creek Nuclear Generating Station," in the Risk-Informed Inspection Notebook for Oyster Creek Nuclear Generating Station.
- Using Table 1 in the "Risk-Informed Inspection Notebook for Oyster Creek Nuclear Generating Station," the specified initiating event likelihood of four (4) was increased by one order of magnitude to three (3), because the finding directly affects the likelihood of an initiating event (per usage rule 1.2, of IMC 0609, Attachment 2, Appendix A).
- Full credit was given for available mitigation capability equipment.
- No operator recovery credit was given.

The inspectors determined that the finding was of very low safety significance (Green) using Table 2, "Initiators and Dependency Table for Oyster Creek Nuclear Generating Station," and Table 3.4, "SDP Worksheet for Oyster Creek Nuclear Generating Station – Loss of Instrument Air (LOIA)," in the Risk-Informed Inspection Notebook for Oyster Creek Nuclear Generating Station. This analysis conservatively estimated the increase in core damage frequency at approximately 1 in 10,000,000 years (low E-7 range). The dominant core damage sequence involved the total loss of instrument air and a stuck open electromagnetic relief valve (EMRV), with successful depressurization and a total loss of low pressure injection or the failure to depressurize.

With the Δ CDF for internal initiating events in the low E-7 range, the senior risk analyst (SRA) conducted a qualitative assessment of potential external event core damage frequency (CDF) initiators in accordance with IMC 0609, Appendix A and the potential increase in the large early release frequency (LERF) using IMC 0609, Appendix H, "Containment Integrity Significance Determination Process." This assessment determined that there was no significant increase in CDF given external events and that the resulting Δ LERF was of very low safety significance. Specifically:

- There was no external event CDF contributor associated with this finding, based on a review of the "Oyster Creek Individual Plant Examinations for External Events

(IPEEE)" report. No fire protection or other external initiating event mitigation credit was attributed to instrument air.

- The Δ LERF was estimated to be in the low E-8 range. Given the core damage sequences that would not result in water on the drywell floor, Appendix H initially estimated the LERF factor at 1.0. However, based on an understanding of the potential operator actions following these core damage sequences, the SRA applied several LERF mitigating factors. The factors included the possibilities of injection via core spray prior to vessel breach, fire water injection, and a unique concrete berm in containment that could be effective in containing core debris. By taking these factors into consideration, the SRA determined that a more appropriate LERF multiplier would be 0.2. Therefore, the increase in LERF was estimated at Δ CDF * 0.2.

The performance deficiency had a cross-cutting aspect in the area of human performance because training was not adequate to ensure proper reassembly of the valve actuator by maintenance personnel. [H.2(b)].

Enforcement: The function of the instrument air system has an impact on overall plant risk. The 'C & D' air dryer inlet valve is not a safety related component, and therefore no violation of regulatory requirements occurred. Nonetheless, because the finding was of very low safety significance (Green) and AmerGen entered this finding into their corrective action program in corrective action program condition report IR 754755, this is identified as a finding. **(FIN 05000219/2008003-01, Improper Valve Reassembly Results in Instrument Air Transient)**

.2 Instrument Air Transient Due to Insufficient Preventive Maintenance on Service Air Compressors

Introduction: A self revealing finding occurred when the suction air filters to the '1-1' and '1-2' service air compressors became clogged with debris which affected the availability and reliability of the compressors on April 25, 2008. In 2001, AmerGen implemented a modification which involved replacing the service air compressors. During the modification process, AmerGen removed preventive maintenance tasks for the suction air filters without adequate technical justification. AmerGen's corrective actions included replacing the inlet air filters, taking action to create a PM to inspect/replace the air filters and reviewing the extent of condition with respect to similar plant modifications. This finding was of very low safety significance (Green) and determined not to be a violation of NRC requirements.

Description: On April 25, 2008, the '1-2' service air compressor tripped due to high inlet air temperature. Operations personnel responded in accordance with alarm response procedures and ABN-35, "Loss of Instrument Air." The '1-1' service air compressor automatically started and maintained system pressure. During the investigation of the '1-2' compressor trip, operations personnel noted that the '1-1' compressor was making abnormal noises and was subsequently removed from service. The '1-3' air compressor started and maintained adequate system pressure. Operations personnel determined that the suction inlet filters to the '1-1' and '1-2' compressors were clogged with debris. Maintenance personnel replaced the suction air filters within 4 hours of the compressor trip (AR A2195358) and placed the '1-1' air compressor in service as the lead

compressor. The '1-2' air compressor was not considered available until April 30 when AmerGen performed an inspection of the compressor and ensured it was not damaged.

Oyster Creek has three service air compressors which provide a consistent supply of air pressure into the instrument air system to be used in various capacities. The '1-1' and '1-2' service air compressors have a common suction line that is routed to the roof and contains two suction inlet air filters. The '1-3' Service Air Compressor has its own suction line with its own inlet air filter.

AmerGen's evaluation (IR 767545) into the cause of this event identified that the air filters had not been replaced since 2001. A plant modification in 2001 replaced the '1-1' and '1-2' reciprocating service air compressors with new rotary screw type compressors. During the modification process, AmerGen removed all of the preventive maintenance tasks (PMs) for the old style compressors and replaced them with PMs contained in the vendor manual for the new compressor. The vendor manual recommended PMs did not include the existing suction air filters because they are external to the compressors. The air inlet filters were outside the boundaries of the modification, which should have been identified during the modification process, and new PMs for their inspection and replacement should have been created when the original PMs were deleted.

The inspectors noted that in 2002, AmerGen had an additional opportunity to identify the removed PMs for the inlet air filters. AmerGen performed a review of their PMs for the service air compressors in accordance with their new preventive maintenance procedure, MA-MA-716-009, Preventive Maintenance (PM) Work Order Process. In accordance with this procedure, AmerGen evaluated their PMs against a standard performance centered maintenance (PCM) template for rotary screw compressors. The template provided guidance to routinely replace and inspect air filters due to their significant impact on compressor availability and reliability.

The performance deficiency associated with this finding involved AmerGen not performing an adequate technical review prior to removing PMs associated with the suction air filters on the '1-1' and '1-2' air compressors. The inspectors noted that procedure 2400-ADM-1220.18 (Rev. 3), "Preventive Maintenance Program," states that supporting documentation and technical justification is required for the deletion of PM's on a component. Revision three was the applicable procedure being used when the performance deficiency occurred. AmerGen performed immediate corrective actions to replace the air filters. In addition, AmerGen has committed to actions to create a PM to inspect/replace the air filters and to perform an extent of condition review of other plant modifications during the 1998-2001 time frame to determine if similar issues exist.

Analysis: The finding was more than minor because it was associated with the equipment 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.

In accordance with IMC 0609.04, "Phase 1 – Initial Screen and Characterization of Findings," the inspectors conducted a Phase 1 SDP screening and determined that a detailed Phase 2 evaluation was required to assess the safety significance because the finding contributed to both the likelihood of a reactor trip and the likelihood that mitigation

equipment would not be available. Specifically, the service air system is a support system to the instrument air system; and a loss of instrument air would result in a reactor scram. Also, the service air system provides support to mitigating systems such as the high pressure feedwater injection system.

The inspectors, with senior reactor analyst (SRA) support, used the "Risk-Informed Inspection Notebook for Oyster Creek Nuclear Generating Station," Revision 2.01a, to conduct a Phase 2 evaluation. It was determined that the Oyster Creek site specific pre-solved Phase 2 SDP worksheets were not suited to assess this event because of the multiple aspects needed to be evaluated and that a Phase 3 analysis should be performed.

The SRA conducted a Phase 3 analysis using the Oyster Creek SPAR model dated April 2, 2008 and version 7.27 of the sapphire risk analysis code. The impact of service air compressor unavailability was not in the base SPAR model, therefore, a logic model was constructed detailing the impact of the service air compressors. Loss of service air compressors would increase the likelihood of a LOIA which would result in a transient initiator (reactor scram). The SPAR model assumptions applied were:

- The unavailability of the '1-1' and '1-2' service air compressors was calculated to be 4 hours. The '1-2' compressor was considered unavailable until the vendor completed their inspection, which totaled 123 hours.
- The '1-3' compressor was considered available for the duration of the event due to its independent suction air filter.
- Loss of all 3 service air compressors would lead to a LOIA. Any service air compressor available was considered success.
- The logic model utilized industry average values for compressor failure to run, failure to start, and test and maintenance basic events from NUREG /CR 6928.
- The base LOIA initiating event likelihood (IEL) was 1E-2/year. The impact of the compressor unavailability would be to increase this LOIA IEL to 6E-2/year for a duration of 123 hours.

The analysis estimated an increase in core damage frequency, because of the increase in LOIA IEL due to the finding, in the range of 1 core damage accident in 10,000,000 years of reactor operations, 1E-8 per year. The only sequences with increases over the base case were LOIA sequences. The dominant core damage sequence safety function successes (S) and failures (F) included the following: A non-recoverable LOIA transient initiator with successes of RPS, EMRVs and MFW with failure of the isolation condenser, shutdown cooling, suppression pool cooling, containment venting, and late injection. This was a failure of containment heat removal sequence.

The finding was determined to be of very low safety significance (Green) based upon the Phase 3 analysis.

In accordance with manual chapter 0612 "Power Reactor Inspection Reports," the inspectors did not identify a cross cutting aspect for this finding because the performance deficiency had occurred several years ago and is not indicative of current performance.

Enforcement: The '1-1' and '1-2' Service Air Compressors are not safety-related components, and therefore no violation of regulatory requirements occurred. Nonetheless, because the finding was of very low safety significance and AmerGen entered this issue into their corrective action program in condition report 767545, this is identified as a finding. **(FIN 05000219/2008003-02, Instrument Air Transient Due to Insufficient Preventive Maintenance on Service Air Compressors)**

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

a. Inspection Scope (2 samples)

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

- 'A' isolation condenser and '1-2' station air compressor unavailable due to planned maintenance on April 2, 2008; and
- '1-1' and '1-2' station air compressors unavailable due to clogging of inlet air filters on April 25, 2008.

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 (when applicable) in accordance with AmerGen's procedures. AmerGen'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 AmerGen'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 (5 samples)

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

- Elevated temperatures on control rod drive (CRD) '26-11' on April 1, 2008 (IR 758427);

- 10 Part 21 issues involving reactor plant instrumentation power supplies on April 23, 2008 (IR 763112);
- Elevated temperatures on CRD 30-25 on May 11, 2008 (IR 774350);
- Incorrect flanges installed on local power range monitors '20-29' and '36-41' on June 12, 2008 (IR 781324); and
- Spurious actuation of one IC logic train results which resulted in vent valve closure on June 13, 2008 (IR 786435).

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 AmerGen'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 Temporary Modification samples)

The inspectors reviewed two temporary modifications that were identified during plant status walk downs. The plant modifications and changes involved:

- Installation of a relay within the position indication module for control rod '30-35' in order to defeat its rod drift alarm due to spurious and distracting alarms. (ECR-OC 08-00202-000)
- An interim revision to surveillance test procedure 651.4.001, "Standby Gas Treatment System Test (SBGT)," to control manually placing SBGT system trains in service for prolonged operation when the normal reactor building ventilation is unavailable. (OC-2008-S-0063)

The inspectors verified that the modifications did not adversely affect the availability, reliability, or functional capability on the systems impacted by the modification or change. Specifically, the inspectors verified that the modifications were consistent with the design and licensing bases of the affected systems. The inspectors also verified that the modifications were installed and operated in accordance with modification documents, work instructions, and procedures. The inspectors reviewed post-installation test results to assess the capability and functionality of the modifications. The inspectors verified that the modifications were being controlled in accordance with AmerGen's procedures. The inspectors also performed a plant walk down of accessible components associated with the modifications to assess the adequacy of the modification. Documents reviewed for this inspection activity are listed in the Supplemental Information attachment to this report.

b. Findings

No significant findings were identified.

1R19 Post-Maintenance Testing (71111.19)a. Inspection Scope (6 samples)

The inspectors observed portions of and/or reviewed the results of six post-maintenance tests (PMT) on the following equipment:

- Reactor high pressure transmitter 'PT-RE15C' on April 5, 2008 (WO C2017393);
- Containment spray system #1 torus spray valve ('V-21-18') on April 14, 2008 (WO R0808375);
- '1-2' emergency service water pump motor on April 15, 2008 (WO R2047254);
- 'E' electromagnetic relief valve (EMRV) on April 22, 2008 (WO C2105805);
- #1 emergency diesel generator on May 15, 2008 (WO R2123423-01); and
- #2 SLC accumulator isolation valve ('V-19-35') on June 18, 2008 (WO C2014079).

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 (1 other outage activity sample)

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

On April 25, 2008, operators initiated a plant shutdown to support a planned maintenance outage. The inspectors observed portions of the shutdown from the control room and reviewed operator narrative logs to verify that technical specification requirements were met for placing the reactor in "hot shutdown" and "cold shutdown." The inspectors verified that cooldown rates during the plant shutdown were within technical specification requirements. The inspectors also verified that the plant shutdown was performed in accordance with AmerGen procedures.

The inspectors performed a walk down of portions of the drywell (primary containment) and the condenser bay area on April 26, 2008, to determine if there was evidence of leakage or visual damage to systems 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 or show evidence of water.

The inspectors verified that AmerGen assessed and managed the outage risk. The inspectors confirmed on a sampling basis that tagged equipment was properly controlled and equipment was configured to safely support maintenance work. During control room tours, the inspectors verified that operators maintained reactor vessel water level and temperature within the procedurally required ranges for the operating conditions. The inspectors verified that the decay heat removal function was maintained by monitoring shutdown cooling parameters and performing a walkdown of the system on April 26. The inspectors verified that offsite and electrical power sources were being maintained in accordance with technical specification requirements and consistent with the outage risk assessment. Periodic walkdowns of portions of the onsite electrical buses and the emergency diesel generators (EDGs) were conducted. The inspectors also observed Oyster Creek’s plant onsite review committee (PORC) startup affirmations on April 27, 2008.

The inspectors performed an inspection and walkdown of portions of the drywell prior to containment close-out on April 26 to verify that debris was not left inside primary containment. The inspectors monitored restart activities that began on April 28 and verified that required equipment was available for operational condition changes, including verifying technical specification requirements, license conditions, and procedural requirements. Portions of the startup activities were observed from the control room to assess operator performance including the reactor going critical on April 28 as well as synchronization of the main turbine generator to the grid on April 29. The inspectors also verified that unidentified leakage and identified leakage rate values were within expected values and within technical specification requirements.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope (1 IST sample and 4 Routine Surveillance samples)

The inspectors observed portions of and/or reviewed the results of five surveillance tests:

- #1 and #2 diesel driven fire pump operability test on April 1, 2008;
- ‘B’ IC shell water level instrument calibration surveillance test on April 9, 2008;
- ‘A’ control room heating, ventilation, and air conditioning operability test on April 15, 2008;
- Main steam isolation valve 10% closure test on May 30, 2008; and
- #2 core spray system valve in-service test (IST) on May 19, 2008.
-

The inspectors verified that test data was complete and met procedural requirements to demonstrate 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

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

b. Findings

Introduction: The inspectors identified that AmerGen had scheduled surveillance tests in a sequence that would have resulted in unacceptable preconditioning of valves within the core spray system on May 19, 2008. This finding was of very low safety significance and was determined not to be a violation of NRC requirements. AmerGen's corrective actions involved reordering the scheduling sequence of the tests and reviewing upcoming (next 60 days) work control schedules to identify potential preconditioning.

Description: On May 19, during plant status, the inspectors identified that the planned work control schedule for testing the core spray system would result in unacceptable preconditioning. Specifically, the American Society of Mechanical Engineers (ASME) Section XI IST tests, 610.4.022 "Core Spray System 2 Pump Operability and Quarterly In-Service Test", and 610.3.006 "Core Spray Isolation Valve Actuation Test and Calibration" were scheduled to be performed before ASME Code Section XI IST test 610.4.003 "Core Spray Valve Operability and In-Service Test". This sequence of testing would have resulted in cycling valves just prior to their in-service stroke time test.

AmerGen personnel evaluated the inspector's concerns (IR 777334) and changed the test sequence to avoid preconditioning of the valves prior to the in-service stroke time test. AmerGen successfully completed core spray testing on May 19, 2008. The inspectors observed portions of the testing and reviewed the test results. The inspectors also reviewed how these tests were scheduled and identified that the testing sequence allowed preconditioning to take place on six different occasions during the previous 2 years.

The inspectors noted in NRC IMC Part 9900 Technical Guidance, "Maintenance - Preconditioning of Structures, Systems, and Components before Determining Operability", and in Exelon Procedure ER-AA-321, "Administrative Requirements for In-service Testing," manipulation of valves during or just prior to surveillance or ASME code testing constitutes unacceptable preconditioning. IMC Part 9900 further states preconditioning of valves could mask their actual as-found condition and result in an inability to verify their operability, and make it difficult to determine whether the valves would perform their intended safety function during an event.

The performance deficiency associated with this finding involved scheduling testing in a sequence that would have resulted in unacceptable preconditioning of valves within the core spray system, which was not in accordance with AmerGen's procedural guidance regarding in-service testing. AmerGen's corrective actions involved reordering the scheduling sequence of the tests and reviewing upcoming (next 60 days) work control schedules to identify potential preconditioning.

Analysis: The finding was more than minor because it was associated with the equipment performance attribute of the mitigating systems cornerstone and affected the objective to ensure the reliability and capability of systems that respond to initiating

events to prevent undesirable consequences. In accordance with IMC 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance because it was not a design or qualification deficiency which resulted in a loss of operability or functionality, did not represent a loss of system safety function, did not represent an actual loss of safety function of a single train for greater than its technical specification allowed outage time, did not represent an actual loss of safety function of one or more non-technical specification trains of equipment designated as risk-significant for greater than 24 hours, and was not potentially risk significant due to a seismic, flooding or severe weather initiating event.

The performance deficiency had a cross-cutting aspect in the area of human performance because AmerGen did not appropriately coordinate work activities to support long term equipment reliability. [H.3(b)].

Enforcement: This issue does not constitute a violation of NRC requirements. The finding was of very low safety significance (Green) and AmerGen documented this issue in corrective action program condition report IR 779599 and 777334. **(FIN 05000219/2008003-03, Potential Preconditioning of Core Spray Valves Prior to ASME In-service Test)**

Cornerstone: Emergency Preparedness [EP]

EP 6 Drill Evaluation (71114.06)

a. Inspection Scope (1 sample)

The inspectors observed one operator requalification activity on May 20 as an input into the NRC's emergency response drill and exercise performance indicator. The inspectors observed AmerGen's critique of the training activity to verify that weaknesses and deficiencies were adequately identified. The inspectors specifically focused on ensuring AmerGen identified operator performance problems with event classification and notification activities.

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 (1 sample)

The inspectors verified during plant walkdowns that AmerGen maintained adequate access controls to locked high radiation in accordance with Oyster Creek technical specifications and AmerGen procedures.

b. Findings

No findings of significance were identified.

Cornerstone: Public Radiation Safety [PS]

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems (71122.01)

a. Inspection Scope (2 samples)

The inspectors reviewed activities and associated documentation in the area of radioactive gaseous and liquid effluent treatment and monitoring.

Inspection Planning and In-office Inspection. The inspectors reviewed the 2006 and 2007 “Radiological Effluent Release” reports for Oyster Creek to verify that the radioactive effluents, monitoring, control, and dose projection program was implemented as described in Oyster Creek’s “Radiological Effluents Technical Specifications (RETS)” and “Offsite Dose Calculation Manual (ODCM).” The inspector reviewed the ODCM to identify recent changes to radioactive waste system design and operation at Oyster Creek. The inspectors determined whether changes to the ODCM were technically justified and documented appropriately.

The inspectors evaluated AmerGen’s analysis on additional discharge pathways from the plant as a result of liquid or gaseous discharges from normal operations and unexpected discharges from spills or leaks, which may have occurred since the previous inspection. The inspector verified that AmerGen had records on sampling locations, type of monitoring, and frequency of sampling to meet 10 CFR 20.1501, “General,” requirements. The inspectors assessed AmerGen’s capability to identify onsite spills/leaks of contaminated fluids during reviews of AmerGen procedures and surveillance test activities.

The inspectors determined whether modifications made to radioactive waste system design and operation could result in changes to the dose consequence to the public. The inspectors verified that technical and/or 10 CFR 50.59, “Changes, Tests, and Experiments,” reviews were performed. The inspectors also verified that AmerGen had set and adjusted its radioactive effluent alarm setpoints in accordance with the methodology and parameters specified within the current ODCM.

The inspectors determined if anomalous results, reported in the current “Radiological Effluent Release” and “Radiological Dose Assessment” reports, were adequately resolved. The inspectors also reviewed AmerGen’s actions to revolve out-of-specification intra-laboratory and inter-laboratory cross-check analysis data for the effluent monitoring program, and to assess the adequacy of AmerGen’s corrective actions for the out-of-specification data.

The inspectors reviewed the UFSAR, RETS and ODCM to identify the effluent radiation monitoring systems and applicable flow measurement devices. The inspectors reviewed

effluent radiological occurrence performance indicator incidents, self-assessments, audits, and event reports to determine if unanticipated offsite releases of radioactive material had occurred since the previous inspection and how they would impact performance indicators.

Onsite Inspection: The inspectors performed walkdowns of accessible portions of the gaseous and liquid release systems, including radiation and flow monitors, filters, tanks, and vessels. The walkdowns were performed to determine if systems were consistent with the descriptions provided in the UFSAR and to evaluate material condition of the systems and components. The walkdowns included the main stack, augmented offgas building vent, and service water radiation monitor. The inspectors also verified that system components were as described in the ODCM and were used for reduction of activity levels in accordance with the RETS and ODCM. During plant tours, the inspectors looked for potential unmonitored radioactive gaseous and/or liquid release pathways.

The inspectors reviewed quality assurance records for laboratory counting instrumentation and reviewed quality control methods. The inspectors reviewed the status of any radioactive liquid waste release plans because Oyster Creek does not routinely release liquid radioactive effluents.

The inspectors reviewed records of gaseous releases made when effluent radiation monitors were out-of-service. The inspectors verified that compensatory sampling and radiological analyses was conducted as required by the RETS and ODCM. The inspectors also determined if AmerGen had placed information on leaks or spills into its 10 CFR 50.75(g), "Reporting and Record Keeping for Decommissioning Planning," decommissioning file.

The inspectors assessed AmerGen's understanding of the location and construction of underground pipes and tanks, and storage pools that contain radioactive contaminated liquids. The inspectors evaluated if AmerGen may have potential unmonitored leakage of contaminated fluids to the groundwater as a result of degrading material conditions or aging of facilities. The inspectors evaluated AmerGen's capabilities of detecting spills or leaks and their ability to identify groundwater radiological contamination both onsite and beyond the owner controlled area. The inspectors reviewed AmerGen's technical bases for their onsite groundwater monitoring and efforts to finalize a routine long-term sample program. The inspectors reviewed ground and surface water sample results. The inspectors discussed with AmerGen personnel their understanding of groundwater flow patterns for the site, and how AmerGen would estimate the pathway of a plume of contaminated fluid both onsite and beyond the owner controlled area in the event of a spill or leak of radioactive material. The inspectors also reviewed the "Oyster Creek Station Hydro-geologic Investigation Report," revision 1, dated September 1, 2006 and Oyster Creek's "Annual Radiological Groundwater Protection Program" sampling results.

The inspector reviewed a selection of 2007 and 2008 monthly, quarterly, and annual dose calculations to ensure that AmerGen properly calculated the offsite dose (both cumulative and projected) from radiological effluent releases and direct radiation to determine if any annual ODCM (i.e., Appendix I to 10 CFR Part 50 values) values were

exceeded. The inspectors evaluated the source term used by AmerGen to ensure all applicable radionuclides discharged, within detectability standards, were included.

The inspectors reviewed air cleaning system surveillance test results on the standby gas treatment system to ensure that system operations were within applicable acceptance criteria. The inspectors also reviewed surveillance test results and methodology AmerGen used to determine the stack and vent flow rates.

The inspectors reviewed calibration records of radiation measurement (i.e., laboratory counting room) instrumentation associated with effluent monitoring and release activities. The inspectors reviewed quality control records for the radiation measurement instruments for indications of degraded instrument performance and the corrective actions taken.

The inspectors reviewed the results of the intra-laboratory and inter-laboratory comparison program to verify the quality of radioactive effluent sample analyses performed by AmerGen. The inspectors reviewed AmerGen's quality control evaluation of the inter-laboratory comparison test data and associated corrective actions for any deficiencies identified. The inspectors also reviewed AmerGen's assessment of any identified bias in the sample analysis results and the overall effect on calculated projected doses to members of the public.

The inspectors also reviewed the results from AmerGen's nuclear oversight department audits to determine whether the licensee met the requirements of the RETS and ODCM.

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

b. Findings

No findings of significance were identified.

2PS2 Radioactive Material Processing and Transportation (71122.02)

a. Inspection Scope (6 Samples)

The inspectors reviewed activities and associated documentation in the area of radioactive material processing and transportation.

The inspectors reviewed the solid waste system description in the UFSAR and recent radiological effluent release reports for information on the types and amounts of radioactive waste. The inspectors also reviewed AmerGen's audit program in this area to verify that it meets the requirements of 10 CFR 20.1101(c), "Radiation Protection Programs."

The inspectors walked down accessible portions of Oyster Creek's radioactive liquid and solid waste collection, processing, and storage systems to: (1) determine if systems and facilities were consistent with descriptions provided in the UFSAR; (2) evaluate their

general material conditions; and (3) identify changes made to the systems. The inspectors reviewed the following items:

- Status of non-operational or abandoned radioactive waste process equipment and the adequacy of administrative and physical controls for those systems;
- Changes made to radioactive waste processing systems and potential radiological impact including conduct of safety evaluations of the changes;
- Current processes for transferring radioactive waste resin and sludge to shipping containers, and the mixing and sampling of the waste;
- Radioactive waste and material storage and handling practices;
- Sources, processing, and handling of radioactive waste at Oyster Creek; and
- The general condition of facilities and equipment.

The inspectors evaluated AmerGen's performance against criteria contained in the UFSAR, 10 CFR Part 20 ("Standards for Protection Against Radiation"), 10 CFR 61 ("Licensing Requirements for Liquid Disposal of Radioactive Waste"), Oyster Creek process control program (PCP), and applicable AmerGen procedures.

The inspector reviewed activities and documentation related to waste characterization and classification:

- Radio-chemical sample analysis results for radioactive waste streams;
- Development of scaling factors for difficult to detect and measure radionuclides;
- Methods and practices for detecting changes in waste streams;
- Classification and characterization of waste relative to 10 CFR 61.55 ("Waste Classification") and 10 CFR 61.56 ("Waste Characterization");
- Implementation of applicable NRC branch technical positions (BTPs) on waste classification, concentration averaging, waste stream determination, and sampling frequency;
- Current waste streams and their processing relative to descriptions contained in the UFSAR and PCP;
- Current processes for transferring radioactive waste resin and sludge discharges into shipping/disposal containers to determine adequacy of sampling; and
- Revisions of the PCP and the UFSAR to reflect changes.

The inspectors reviewed the training and qualification program for personnel who handle, package, and ship radioactive materials for the following five radioactive material shipments: OC-2001-08, OC-3001-08, OC-4002-08, OC-4004-08, and OC-8002-07. The inspectors also verified that AmerGen established and implemented a training program based on job task reviews.

The inspectors evaluated AmerGen's performance against criteria contained in NRC Bulletin 79-19, "Packaging of Low-Level Radioactive Waste For Transport and Burial" and 49 CFR 172 Subpart H ("Training").

- The inspectors reviewed the shipment records and documentation associated with five non-excepted shipments of radioactive material (shipment numbers: OC-2001-08, OC-3001-08, OC-4002-08, OC-4004-08, and OC-8002-07). The inspectors reviewed:

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- Implementation of shipping requirements;
- Implementation of the specifications in Certificates of Compliance, for the approved shipping casks including limits on package contents;
- Classification and characterization of waste relative to 10 CFR 61.55 and 10 CFR 61.56;
- Implementation of recent NRC and Department of Transportation shipping requirements rule changes;
- Implementation of 10 CFR 20, Appendix G (“Control of Exposure From External Sources in Restricted Areas”);
- Implementation of specific radioactive material shipping requirements;
- Packaging of shipments;
- Labeling of shipping containers;
- Placarding of transport vehicles;
- Conduct of vehicle checks;
- Provision of driver emergency instructions;
- Completion of shipping papers/disposal manifests;
- Evaluation of package against package performance standards (as appropriate); and
- Conformance with AmerGen procedures for cask loading, closure, and use requirements including consistency with cask vendor approved procedures.

The inspectors reviewed Oyster Creek’s “Annual Radioactive Effluent Release Report for 2007” to gain an understanding of the types and quantities of radioactive waste shipped offsite and to assess changes to the PCP.

The inspectors reviewed audits and assessments associated with radioactive waste handling, processing, storage, and shipping programs. The inspectors also reviewed corrective action program condition reports which involved potential radioactive material processing and transportation issues.

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

b. Findings

No findings of significance were identified.

2PS3 Radiological Environmental Monitoring Program

a. Inspection Scope (1 sample)

The inspectors reviewed activities and documentation associated with the Radiological Environmental Monitoring Program (REMP). The inspectors evaluated AmerGen’s performance against criteria contained in the Oyster Creek technical specification, AmerGen procedures, and the REMP program requirements as outlined in the Oyster Creek ODCM, NRC BTP (“An Acceptable Radiological Environmental Monitoring Program”), and NUREG 130 (“Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Boiling Water Reactors”).

The inspectors reviewed the 2007 "Annual Environmental Monitoring Report". The inspectors reviewed the report to identify changes to the ODCM with respect to environmental monitoring, commitments in terms of sampling locations, monitoring and measurement frequencies, land use census, inter-laboratory comparison program, and analysis of data.

The inspector also reviewed the ODCM to identify environmental monitoring stations. The inspectors reviewed AmerGen self-assessments, audits, licensee event reports, and inter-laboratory comparison program results. The inspector reviewed the scope of the audit program.

The inspectors reviewed any changes made by AmerGen to the ODCM as the result of changes to the land use census or sampler station modifications. The inspectors reviewed technical justifications for any changed sampling locations.

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 Verification (71151)

a. Inspection Scope (4 samples)

The inspectors reviewed performance indicator (PI) data associated with four PIs. The inspectors used the guidance provided in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline" to assess the accuracy and completeness of the PI data. Documents reviewed for this inspection activity are listed in the Supplemental Information attachment to this report.

The inspectors reviewed AmerGen's reported April 1, 2007 through March 30, 2008 data for the following PIs.

- "Unplanned Scrams per 7000 Critical Hours,"
- "Unplanned Transients per 7000 Critical Hours,"
- "Scrams with Complications;" and
- "Safety System Functional Failures (SSFF)."

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

The inspectors performed a daily screening of items entered into AmerGen'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, and accessing AmerGen'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 a semi-annual trend review. The inspectors reviewed AmerGen'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 January through June 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 (isolation condenser, reactor building closed cooling water, core spray, containment spray, and service water systems) and did not identify any adverse trends. The inspectors also reviewed corrective action program condition reports associated with human performance issues and program implementation and did not identify any significant adverse trends.

In March 2008, the inspectors noted that in some cases corrective action work orders were not being completed in a timely manner. Specifically, a corrective action work order to replace an EMRV pressure switch was rescheduled four different times. The corrective action for the EMRV stemmed from a December 2006 event in which an EMRV spurious lifted with the plant at full power. See NRC inspection report 05000219/2007002, dated May 7, 2007 (ADAMS Ref. ML071270262) for additional details. AmerGen personnel evaluated the inspector's concerns in condition report IR 739616. AmerGen performed a review of equipment apparent cause evaluations (EACE) completed between January 1, 2007 and March 1, 2008 to identify all corrective actions which were being tracked through work orders in the work management system. AmerGen identified that nine of the corrective actions requiring field work to resolve an issue had either past their scheduled due date with no work performed or the current

plan would not ensure resolution prior to the completion of Oyster Creek's next refueling outage. AmerGen concluded that corrective actions program evaluations that rely on work orders to resolve a condition adverse to quality needed to be better monitored in order to ensure timely resolution of the issue.

.3 Annual Sample Review

a. Inspection Scope (1 Annual sample)

The inspectors reviewed AmerGen's evaluation and corrective actions associated with the unavailability of the '1-1' diesel driven fire pump caused by the pump failing its functional test on November 7, 2007 (IR 696018). The inspectors reviewed relevant condition reports to ensure that the full extent of the issue was identified, evaluated, and that corrective actions were specified and prioritized. The inspectors discussed this issue with engineering personnel, reviewed surveillance procedures and performed a walk down of the pump. The inspectors also observed a monthly surveillance test on the diesel driven fire pumps on April 1, 2008. Documents reviewed for this inspection activity are listed in the Supplemental Information attachment to this report.

b. Findings and Observations

There was one Green, self revealing, non-cited violation (NCV) identified due to AmerGen personnel not properly implementing a functional test procedure on the '1-1' diesel driven fire pump.

The inspectors determined that, in general, the corrective actions taken to address the unavailability of the '1-1' fire pump were reasonable and adequate. While observing testing on April 1, 2008, the inspectors noted that while the operators visually compared the stroboscope readings with the un-calibrated tachometer on the diesel driven fire pump, the procedure did not require the operators to record the diesel's tachometer (rotations per minute) RPM value. In addition, the procedure did not specify acceptance criteria for agreement between stroboscope and tachometer readings. The inspectors noted that while these observations would enhance testing procedures, it did not reduce the effectiveness of AmerGen's corrective actions. AmerGen entered these observations into their corrective action program (IR 761101). The inspectors determined that AmerGen's corrective actions were effective during the diesel driven fire pumps functional test completed on April 1, 2008. The inspectors noted that AmerGen adequately implemented the maintenance rule program for the pump failure.

Introduction: A self revealing finding occurred when AmerGen did not properly implement a functional test procedure for the '1-1' diesel driven fire pump on November 7, 2007. Specifically, operations personnel did not accurately measure the speed of the pump while performing the functional test resulting in the pump being declared inoperable and unavailable for greater than three weeks during troubleshooting by AmerGen personnel. This finding was of very low safety significance and determined to be a non-cited violation (NCV) of technical specification 6.8, "Procedures and Programs."

Description: On November 7, 2007, operations personnel performed test procedure 645.4.012, "Fire Pump Functional Test," and determined that the '1-1' diesel driven fire pump's discharge pressure was 115 psig with an operating speed of 1806 RPM, less than 156 psig as specified in the procedures. The acceptance criteria in the procedure states if the pump's discharge pressure is less than 156 psig when the total calculated flow is 2000 gallons per minutes (gpm), the pump is inoperable. Additionally, it states that pressure and flow data should be collected when the diesel is operating at a shaft speed between 1800 and 1840 RPM using a handheld stroboscope. Operations personnel shutdown the diesel driven fire pump and documented the issue in corrective action program condition report IR 696018.

Maintenance personnel initiated troubleshooting activities (work order M2180383) to determine the cause of the pump's inability to achieve adequate discharge pressure. Troubleshooting activities included ensuring that the discharge relief valve V-9-57 was not leaking, analyzing pump vibration data, and inspection of the pump's suction strainer to ensure no significant blockage had occurred. No documented deficiencies were identified. On November 30, 2007 the pump was replaced (WO C2016287), and on December 1, 2007 a PMT was performed utilizing procedure 645.4.012.

During performance of the PMT, the pump's discharge pressure was found to be less than 156 psig with the pump running at a measured speed of 1862 RPM. Maintenance performed additional troubleshooting with assistance from engineering personnel. Engineering personnel questioned the RPM readings that were recorded and directed that additional data points along the pump shaft be taken to measure pump speed. Based on these actions it was determined that the initial RPM readings were not accurate because the actual speed of the diesel was 1561 RPM vice 1862 RPM. On December 2, 2007, the speed of the diesel was increased to 1815 RPM using the manual speed adjustment and verified using alternate calibrated speed measuring instrumentation. The PMT was completed satisfactorily and all the acceptance criteria as specified in test procedure were met.

AmerGen performed an evaluation (IR 713304) and concluded that operations personnel incorrectly determined the '1-1' diesel driven fire pump speed while using the stroboscope. This was due to a lack of specific speed indication markings on the harmonic balancer and lack of understanding of harmonic distortion. AmerGen also determined that the speed setting which was found to be less than 1840 RPM on December 2, 2007 was due to not controlling position of the speed adjustment screw during various troubleshooting activities in response to the November 7, 2007 test results.

The inspectors noted that there was no specific guidance in the procedure on how to use the stroboscope to measure the speed of the diesel. Additionally, the inspectors noted AmerGen's training program does not verify operators are qualified or understand how to use a stroboscope. The inspectors also reviewed licensee documents and found no record of a vendor manual on site to provide guidance on use of the stroboscope. The inspectors reviewed the manufacturer's manual online, and noted that in Section 4.0, "Using the Stroboscope to Measure RPM," it states that if measuring the speed of a symmetrical object (pump shaft), a piece of reflective tape or paint in a single location should be used as a reference point to ensure errors are prevented. The inspectors

noted that this practice was not being consistently used by operations personnel to monitor the speed of the diesel when performing testing.

The performance deficiency associated with this finding involves AmerGen not adequately implementing a procedure to ensure the '1-1' diesel driven fire pump was functional on November 7, 2007. Specifically, AmerGen personnel did not accurately measure the speed of the diesel while performing the functional test, resulting in the pump being declared inoperable and in unnecessary unavailability for 27 days. AmerGen's corrective actions included revising the procedure to include vendor guidance for measuring speed and providing additional training to operators to accurately monitor speed of the diesel.

Analysis: The finding was more than minor because it was associated with the equipment performance attribute of the mitigating systems cornerstone and affected the objective to ensure the availability and reliability of systems that respond to initiating events to prevent undesirable consequences. In accordance with IMC 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the inspectors conducted a Phase I SDP screening and determined that the finding was of very low safety significance (Green). The finding was of low safety significance because there was no loss of safety function due to the availability of the redundant diesel driven fire pump.

The inspectors also reviewed this issue in accordance with IMC 0609, Appendix F, "Fire Protection Significance Determination Process," to confirm the above results. The finding was determined to be of very low safety significance (green) because it was assigned a low degradation rating due to other available fire protection pumps.

The performance deficiency had a cross-cutting aspect in the area of human performance because training was not adequate to ensure the proper use of the stroboscope by operations personnel during testing. Specifically, this activity was previously performed by maintenance personnel and adequate training was not provided prior to turn-over of responsibilities [H.2(b)].

Enforcement: Oyster Creek technical specification, section 6.8, "Procedures and Programs," states, in part, that written procedures shall be established and implemented for the Fire Protection Program. Oyster Creek procedure 101.2, "Oyster Creek Site Fire Protection Program," states, in part, that at least once per 18 months a system functional test verifying that each diesel driven fire pump develops at least 2000 gpm at a discharge pressure of 156 psig will be performed. Oyster Creek procedure 645.4.012, "Fire Pump Functional Test," is used to ensure compliance with the Fire Protection Program testing requirement. Contrary to the above, AmerGen did not properly implement functional test procedure 645.4.012 on November 7, 2007 which resulted in unnecessary unavailability of the '1-1' diesel driven fire pump. However, because the finding was of very low safety significance (Green) and has been entered into their corrective action program in condition report IR 696018 and 707480, this violation is being treated as an NCV, consistent with section IV.A of the NRC Enforcement Policy. **(NCV 05000219/2008003-04, Diesel Driven Fire Pump Unavailable Due to Improper Testing)**

40A5 Other.1 Independent Spent Fuel Storage Installation (ISFSI) Monitoring Controls.a. Inspection Scope (60855.01)

The inspectors reviewed routine operations and monitoring of the ISFSI, including the radiological / contamination survey records for the transfer of dry shielded canisters. The inspectors performed a walk down of the ISFSI with AmerGen personnel. During the walk down the inspectors performed independent surveys of the storage modules and confirmed that module temperatures were within the required limits. The inspectors verified that surveillances were conducted at the specified required frequency. The inspectors also reviewed plant equipment operator logs for ISFSI surveillances and the environmental dosimetry records for the ISFSI. The inspectors evaluated AmerGen's radiological control activities associated with the ISFSI against criteria contained in 10 CFR 20, ISFSI technical specifications, and AmerGen procedures.

b. Findings

No findings of significance were identified.

40A6 Meetings, Including Exit

2007 Annual Assessment Meeting. The NRC conducted a meeting with AmerGen on May 15, 2008 to discuss NRC's assessment of safety performance at Oyster Creek for the calendar year 2007. During the meeting, Mr. Marc Dapas, Deputy Regional Administrator for the NRC Region 1 office, discussed Oyster Creek's performance with members of AmerGen's management lead by Mr. Tim Rausch, Station Vice President. The meeting was open for public observation. A copy of the meeting notice, slide presentation, and a summary of the meeting can be found in ADAMS under accession reference numbers ML081160259, ML081060600, ML081410562, respectively.

Resident Inspector Exit Meeting. On July 18, 2008, the inspectors presented their overall findings to members of AmerGen's management led by Mr. J. Randich, Plant Manger, and other members of his staff who acknowledged the findings. The inspectors confirmed that proprietary information reviewed during the inspection period was returned to AmerGen.

40A7 Licensee-Identified Violations

None.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

SUPPLEMENTAL INFORMATION**KEY POINTS OF CONTACT**Licensee Personnel

J. Dent, Director, Work Management
 J. Dostal, Shift Operations, Superintendent
 S. Dupont, Regulatory Assurance Specialist
 A. Ferenga, Manager, Radiation Protection Technical Support
 S. Hutchins, Senior Manager Design Engineering
 T. Keenan, Manager Security
 D. Kettering, Director, Engineering
 J. Kandasamy, Manager, Regulatory Assurance
 G. Ludlam, Director, Training
 J. Makar, Senior Manager System Engineering
 P. Orphanos, Director, Operations
 R. Peak, Director, Engineering
 D. Peiffer, Manager Nuclear Oversight
 J. Randich, Plant Manager
 T. Rausch, Site Vice President
 H. Ray, Manager, Engineering Programs
 J. Renda, Manager Radiation Protection
 T. Schuster, Manager Environmental/Chemistry Manager
 T. Sexsmith, Manager Corrective Action Program
 J. Vaccaro, Director, Maintenance

Others:

State of New Jersey, Bureau of Nuclear Engineering

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSEDOpened/Closed

05000219/2008003-01	FIN	Improper Valve Reassembly Results in Instrument Air Transient (Section 1R12)
05000219/2008003-02	FIN	Instrument Air Transient Due to Insufficient Preventive Maintenance on Service Air Compressors (Section 1R12)
05000219/2008003-03	FIN	Potential Preconditioning of Core Spray Valves Prior to ASME In-service Test (Section 1R22)
05000219/2008003-04	NCV	Diesel Driven Fire Pump Unavailable Due to Improper Testing (Section 4OA2)

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-AA-108-107-1001, "Station Response to Grid Capacity Conditions"
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 Inspection"
OP-OC-108-109-1003, "Winter Readiness"
ABN-60, "Grid Emergency"

Other Documents

NRC Generic Letter 2006-02, "Grid Reliability and The Impact on Plant Risk and The Operability of Offsite Power"
"Protocol between Exelon Nuclear and First Energy", dated April 6, 2007

Section 1R04: Equipment Alignment

Procedures

101.2, "Oyster Creek Site Fire Protection Program"
310, "Containment Spray System Operation"
322, "Service Water System"
333, "Fire Barrier Penetration Surveillance"
645.4.017, "Fire Pump #1 Operability Test"
645.4.017, "Fire Pump #1 Operability Test"
645.4.020, "Redundant Fire Protection Water Supply Pump Functional Test"
645.4.036, "Fire Pump #2 Operability Test"
ABN-29, "Plant Fires"
OP-OC-108-101-1002, Maintaining Equipment Alignment Attachments

Drawings

BR 2005 SH 2, "Reactor and Turbine Building Service Water System"
JC 19479 SH 3 & 4, "Fire Protection Water System Flow Diagram"

Condition Reports (IR)

351223, 528857, 574777, 582362, 583176, 591053, 591366, 591416, 594087, 601952, 602858, 602861, 605165, 622747, 640296, 654635, 656735, 659241, 672666, 680196, 713304, 746937, 754061, 756620, 756908, 756924, 757167, 759081, 759685, 759687, 760129, 761101, 762519, 763390, 763658, 763766, 764284, 791362, 769980, 769991

Other

607.4.016, "Containment Spray and Emergency Service Water System I Pump Operability and Quarterly Inservice Test," dated 4/15/08 and 4/17/08
645.4.012, "Fire Pump Functional Test," dated 4/8/08
645.4.019, "Redundant Fire Protection Water Supply Pump Operability Test," dated 1/9/08 and 4/9/08

645.4.036, "Fire Pump #2 Operability Test," dated 4/8/08
645.6.004, "Fire Suppression Water System Valve Lineup," dated 12/20/07 and 4/14/08
680.4.007, "Safety Related Equipment Verification," dated 4/10/08
OP-OC-108-101-1002 Attachment 1, System Lineup Verification, dated 4/14/08
703714-10, #1 Diesel Fire Pump (a)(1) Action Plan, Rev. 0
Clearance #0250852, #08500202, #08500431, #08500466, #08500469, #08500524
Fire Protection Water System (SYSID 811) System Health Overview, 1st Quarter 2008
OC-7 Functional Failure Definition for System 811 (Fire Protection Water System)
OP-OC-108-101-1002 Attachment 1, System Lineup Verification, dated 4/14/08
Plant Health Committee System Presentation (for fire protection systems 176, 811, 813, 814),
December 2007
Redundant System Operability Verification Checksheet (for tagging "A" isolation condenser),
dated 4/2/08
Redundant System Operability Verification Checksheet (for tagging #2 fire diesel), dated 4/8/08

Section 1R05: Fire Protection

Procedures

ABN-29, "Plant Fires"
101.2, "Oyster Creek Site Fire Protection Program"
CC-AA-211, "Fire Protection Program"
OP-OC-201-008, "Oyster Creek Nuclear Generating Station Pre-Fire Plans"
OP-AA-201-009, "Control of Transient Combustible Material"
333, "Plant Fire Protection System"
645.6.017, "Fire Barrier Penetration Surveillance"
328, Turbine Building Heating and Ventilation System
J-8-F, Cond/FD PMP BRG TEMP HI

Condition Reports (IR)

579878, 761057

Work Orders (AR)

R2117500

Other Documents

Oyster Creek Nuclear Station Fire Hazards Analysis (990-1746)
08-005, Transient Combustible Permit: TB-FZ-11F, dated June 9, 2008
990-1746, Fire Hazards Analysis Report
TB-FZ-11F, Oyster Creek Nuclear Generating Station Pre-Fire Plan - Feed Pump Room

Section 1R11: Licensed Operator Regualification Program

Procedures

ABN-1, "Reactor Scram"
ABN-6, "Control Rod Malfunction"
EMG 3200.01A, "RPV Control – No ATWS"
EMG 3200.01B, "RPV Control – ATWS"
302.1, "Control Rod Drive System"

Other Documents

EOP User's Guide (2000-BAS-3200.02)
Oyster Creek Emergency Action Level (EAL) Matrix

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-716-012, Post Maintenance Testing
MA-MA-716-010-1007, Post Maintenance Testing (PMT)

Drawings

30049-15, Inlet & Exhaust Vlv. Assy.'s 1" Nominal DHA-OCS-DEA
30071-32, Inlet & Exhaust Vlv. Assy.'s 2" Nominal DHA-DEA

Condition Reports (IR)

753488, 753495, 753495, 753585, 754755

Work Orders (AR)

R2099991-01, R2099991-02

Other Documents

NEI 93-01, "Industry Guideline for monitoring the Effectiveness of Maintenance at Nuclear Power Plants"
VM-OC-0708, Pneumatic Products Instrument Air Dryers A & B

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"
ABN-35, "Loss of Instrument Air"
334, "Instrument and Service Air System"

Condition Report (IR)

2004-0296, 2004-3163, 2005-2108, 688613, 716579, 724535, 758213, 759449, 767545

Work Orders (AR)

R2110390

Other Documents

609.4.001, "Isolation Condenser Valve Operability and In Service Test," dated 4/2/08
609.4.010, "Isolation Condenser Make Up Line Check Valve In-Service Test," dated 4/1/08
Attachment 307-7, Valve Checkoff List for Isolated Isolation Condenser Being Returned to Service, dated 4/2/08
Clearance #07501808, #08500409
Paragon Risk Profile for April 2 and 25, 2008
Operations Narrative Log, dated April 25, 2008

Section 1R15: Operability Evaluations

Procedures

OP-AA-108-115, "Operability Determination"
235, Determination and Correction of Control Rod Drive System Problems
617.4.003, Control Rod Scram Insertion Time Test and Valve IST test

Drawings

107C5053, LPRM Flange
RS-08-1355-211, LPRM Assembly

Condition Reports (IR)

758427, 652757, 758188, 758430, 758431, 763112, 766648, 166649, 766651, 766654, 763112,
766648, 766649, 766651, 766654, 774350, 781324, 786435, 786522

Work Orders (AR)

R2066281

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
GE SIL No. 173, "Control Rod Drive High Operating Temperature" (dated, May 28, 1976)
GE SIL No. 173, Supplement 1, "Control Rod Drive High Operating Temperature" (dated,
September 20, 1999)
GE SIL No. 173, Supplement 1, Revision 1, "Control Rod Drive High Operating Temperature"
(dated, September 21, 2007)
Technical Specification 3.2, "Reactivity Control"
3.2.B.3, Oyster Creek Nuclear Generating Station Technical Specifications: Control Rod System
3A-SK-M-438, Operations Plant Manual Fig. 23-10: Initiation Logic Condenser B
MA-AA-716-004, Complex Troubleshooting Data Sheet for IsoCondenser B
Adverse Condition Monitoring and Contingency Plan: CRD 30-35 Temperature, dated May 13,
2008
Technical Evaluation: Control Rod 26-35 and 30-25 Scram Times, dated May 23, 2008

Section 1R18: Plant Modifications

Procedures

235, "Determination and Correction of Control Rod Drive System Problems"
329, "Reactor Building Heating, Cooling and Ventilation System"
330, "Standby Gas Treatment System"
651.4.001, "Standby Gas Treatment System Test"
ABN-6, "Control Rod Malfunctions"
LS-AA-104, "Exelon 50.59 Review Process"
LS-AA-104-1000, "Exelon 50.59 Resource Manual"
RAP-H6a, "Rod Drift"

Condition Reports (IR)

576353, 576360, 614312, 651271, 653791, 657184, 680596, 699635, 716494, 721370, 725731,
727418, 728428, 729888, 730714, 730991, 732066, 732634, 733778, 736559

Other

UFSAR Sections 6.51, 7.3, 7.7.1.1, 15.4.1, 15.4.2, 15.4.9, and 15.6
ECR OC 08-00202, Temporarily Defeat Rod 30-35 "7" Input to Rod Drift Alarm, Rev. 0
OC-2008-S-0063, 50.59 Screening for 651.4.001, Standby Gas Treatment System Test, dated
4/14/08
651.4.001, "Standby Gas Treatment System Test," dated 4/14/08, 4/15/08, & 4/16/08

Section 1R19: Post-Maintenance Testing

Procedures

MA-AA-716-012, "Post Maintenance Testing"
OP-MA-109-101, "Clearance and Tagging"
602.3.004, "Electromagnetic Relief Valve Pressure Sensor Test and Calibration", Rev. 44
609.3.003, "Isolation Condenser Automatic Actuation Sensor Calibration and Test"
MA-AA-723-301, "Periodic Inspection of Limitorque Model SMB/SB/SBD-000 Through 5 Motor
Operated Valves"
RAP-B7a, "ESW Pump B Trouble"

Drawings

3E-611-17-004 SH 2, "Control Panel 1F/2F-ANNUN. B"
GE 157B6350 SH 167A, "PRESS SUPPR Chamber Spray VLV (SYS I) V-21-0018"
GE 223R0173 SH 16A, "4160V SWGR 1C Unit C3 EMER Service water PMP 1-2 (52B)"

Condition Report (IR)

759541, 374774, 763787

Work Order (AR)

R2102033, C2017393, A2193949, A0707746, A2066293, A2139604, R2047254, C2105805

Other

LISU-532-3B, "ESW Pump Motor 1-2 Upper Bearing Oil Level Alarm Instrument Calibration
Sheet"

Section 1R20: Refueling and Outage Activities

Procedures

201, "Plant Startup"
203, "Plant Shutdown"
305, "Shutdown Cooling System Operation"
ER-AA-600-1043, "Shutdown Risk Management"
OP-AA-108-108, "Unit Restart Review"
OU-AA-103, "Shutdown Safety Management Program",

Condition Report (IR)

767804, 767851, 767867, 767870, 767871, 767877, 767919, 767921, 767923, 767997, 768000,
768002, 768004, 768007, 768008, 768010, 768026, 768037, 768039, 768062, 768063, 768064,
768068, 768071, 768080, 768088, 768092, 768172, 768177, 768197, 768199, 768228, 768233,
768238, 768272, 768316, 768328, 768374, 768387, 768399, 768425, 768427, 768428, 768432,
768455

Drawing

BR 2002, Reheat Steam System Flow Diagram, Sht. 4

Other

OC1C21-17.0, "Reactivity Management Plan", dated 4/25/08
Oyster Creek Generating Station 1M16 Maintenance Outage Shutdown Safety Plan, Rev. 0
Reactor Scram Data Review, 4/26/08
Plant Oversight Review Committee Meeting Agenda, 4/27/08

Section 1R22: Surveillance Testing

Procedures

SA-AA-129, "Electrical Safety"
MA-AA-1000, "Conduct of Maintenance"
307, "Isolation Condenser System"
331.1, "Control Room and Old Cable Spreading Room Heating, Ventilation and Air Conditioning System"
RAP-C6b, "Shell B LVL HI/LO"
602.4.004, Main Steam Isolation Valve 10% Closure Test
610.3.006, Core Spray Isolation Valve Actuation Test and Calibration
610.4.003, Core Spray Valve Operability and In-Service Test
610.4.022, Core Spray System 2 Pump Operability and Quarterly In-Service Test
ER-AA-321, Administrative Requirements for Inservice Testing

Drawings

BR 2010 SH 4, "Spreading Rooms HVAC Flow Diagram"
3E-611-17-005 SH 2, "Elec. Elem. Diagram Control Panel 1F/2F-Annuc. C"
GE885D781, Core Spray System Flow Diagram

Condition Reports (IR)

761126, 763970, 711138, 777409, 777840, 777859, 777334, 779599

Work Orders (AR)

A2185561, R2099526, R2109085, R2109574, R2112773-01, R2112810, R2112816-01,
R2119513, R2123462

Other Documents

NRC Inspection Manual Part 9900 Technical Guidance, "Maintenance- Preconditioning of Structures, Systems, and Components Before Determining Operability"
C-1302-211-E320-126, "Isolation Condenser Shell Level Uncertainty (Normal Environment)," Rev. 4
609.3.008, "Isolation Condenser "B" Shell Water Level Instrument calibration (IG06B)," dated 4/9/08
609.4.001, "Isolation Condenser Valve Operability and In Service Test," dated 4/9/08
645.4.017, "Fire Pump #1 Operability Test," dated 4/1/08
645.4.036, "Fire Pump #2 Operability Test," dated 4/1/08
654.4.003, "Control Room HVAC System Operability Test," dated 4/15/08
9900, Technical Guidance: Maintenance - Preconditioning of Structures, Systems, and Components before Determining Operability
NUREG 1482, Guidelines for Inservice Testing at Nuclear Power Plants
Week 0821 NDO Sheet, dated May 15, 2008

Section 2PS1: Radioactive Gaseous and Liquid Effluent Treatment & Monitoring Systems

Procedures

CY-AA-170-2150, "PCSC Program Implementation"
CY-AA-170-210, "Potentially Contaminated System Controls Program"
CY-OC-120-1101, "Primary System Sample and Analysis Schedule"
CY-OC-120-1102, "Auxiliary Plant System Sample and Analysis Schedule"
CY-OC-120-1105, "Chemical Additive System Sample and Analysis Schedule"
ER-AA-2002, "System Health Indicator Program"
CY-AA-130-200, "Quality Control"
CY-AA-170-100, "Quality Assurance for Radiological Monitoring Programs"

Condition Reports (IR)

438790, 439161, 455297, 497056, 520188, 521425, 536360, 559255, 560827, 658467, 787362, 787359, 387354

Other Documents

Annual Effluent Release Reports - 2006, 2007
Annual Radiological Environmental Monitoring Report - 2006, 2007
Annual Radiological Groundwater Protection Program Results- 2007
Intra and Inter Laboratory Cross-check Analysis Results – 2007/2008
Offsite Dose Calculation Manual (Revision 0, 1, 2)
Environmental Airborne Radioactivity Sampler Calibration Data
10 CFR 50.75(g) histories file record summary
Laboratory Counting Systems - Calibration Records.
Effluent Radiation Monitor Surveillance and Calibration Records (recent)
Stand-by Gas Treatment System Surveillance testing data (latest)
Stack RAGEMs Long Term Improvement Plan
Quarterly SHIP System Report (Radiation Monitoring System) (2007-2008)
Meteorological Tower Monthly Monitoring Report (2008)
Process Radiation Monitor Operability Data
Inter and Intra-laboratory Quality Assurance data and Measurements and Cross-checks
Source Term analysis data (10 CFR Part 61 Report – February 14, 2008)
Monthly, Quarterly, Yearly Public Dose Projection Data (2007 and 2008)
Compensatory Sampling Analysis data - 2007

Section 2PS2: Radioactive Material Processing and Transportation

Procedures

CY-OC-120-702, "Radwaste System Sample Collection"
RP-AA-120, "Radwaste Processing Input Control Program"
RP-AA-300, "Radiological Survey Program"
RP-AA-302, "Determination of Alpha Monitoring Levels"
RP-AA-500, "RAM Control"
RP-AA-600, "Radioactive material / waste shipments"
RP-AA-600-1001, "Exclusive Use & Emergency Response Information"
RP-AA-600-1002, "Highway Route Control Quantity (HRCQ) / Advanced Notification for Radioactive Waste Shipments"
RP-AA-600-1003, "Radioactive Shipments to Barnwell and the Defense Consolidation Facility (DCF)"
RP-AA-600-1004, "Radioactive Waste Shipments to Environcare"
RP-AA-600-1005, "Radioactive Material and Non Disposal Site Waste Shipments"

RP-AA-600-1006, "Notification Requirements for Radioactive Waste Shipments Greater than the Radioactive Material Quantities of Concern (RAMQC)"
RP-AA-600-1007, "Radioactive Waste Shipments to Environcare Bulk Waste Facility (BWF)"
RP-AA-602, "Packaging of Radioactive Material Shipments"
RP-AA-602-1001, "Packaging of Radioactive Material / Waste Shipments"
RP-AA-603-1001, "Inspection and Loading of Radioactive Material / Waste Shipments"
RP-AA-605, "10CFR61 Program"
RP-OC-605-1001, "Oyster Creek 10CFR61 Program"
RP-OC-6001, "Low Level Radwaste Storage Facility Receipt, Transfer, Storage, and Shipment of Radioactive Waste and Reusable Equipment"
RP-OC-6003, "Oyster Creek Radioactive Material / Waste Container Control"
RP-OC-6004, "Oyster Creek Cask Handling Program"
RW-AA-100, "Process Control Program for Radioactive Wastes"
Oyster Creek 205.13, "HSM Monitoring While Containing Fuel"
Oyster Creek 233, "Drywell Access and Control"
Oyster Creek 351.4, "Solid Radwaste Operating Procedure"
Oyster Creek 352.0, "Process Control Plan for Processing Filter Media and Resins Using S.E.G. Supplied Equipment"

Drawings

3E-154-02-001, "General Arrangement Old Radwaste Building"
3E-155-02-001, "General Arrangement New Radwaste Building"

Condition Reports (IR)

625612, 629188, 650082, 672106, 727912, 749254, 758127, 763817, 764509, 769399, 769407, 769415, 769418, 769424, 769619

Other Documents

Shipment # OC-2001-08, LSA II
Shipment # OC-3001-08, LSA II
Shipment # OC-4002-08, LSA II
Shipment # OC-4004-08, LSA II
Shipment # OC-8002-07, Type B
S20-AD-010 Rev. 22, "Barnwell waste management facility site disposal criteria Chem-Nuclear Systems Barnwell office"
10 CFR Part 61 Sampling and analysis results
Radioactive shipping container certifications
South Carolina Dept. of Health and Environmental Control Radioactive Material License (Barnwell Waste disposal facility) license #097, Amendment #47.
Training program - DOT/79-19 Training for support of radioactive and asbestos shipments
Training program - Site specific portion of radioactive material shipping training program
Training program - Shipper refresher
Uniform low-level radioactive waste manifest
Radiation / contamination surveys
RP-OC-1001-08-001, Dated 2/26/08, "Oyster Creek 10CFR61 Program Waste Stream Analysis and Scaling Factor Determination"
RP-OC-1001-08-002, Dated 3/2/08, "Initial Alpha Determination at Oyster Creek"
RP-OC-1001-08-003, Dated 3/19/08, "Evaluation of Plant Isotopes and Energies at Oyster Creek for 2007 and 2008"
RP-OC-1001-08-004, Dated 3/19/08, "Gross Beta and Gross Alpha DAC Values for 2008"
RP-OC-1001-08-005, Dated 3/20/08, "Gross Beta and Gross Alpha DAC Values for 2007"

RP-OC-1001-08-006, Dated 3/19/08, "Annual Bioassay Program Review for 2006 and 2007"
RP-OC-1001-08-008, "Prospective Dose Evaluation for External Monitoring"
RP-OC-1001-08-009, "Trend Index for Scaling Factors Shifts"

Section 2PS3: Radiological Environmental Monitoring Program

Procedures

CY-AA-170-200, "Radiological Effluent Controls Program"
CY-AA-170-300, "Offsite Dose Calculation Manual Administration"
CY-AA-170-000, "Radioactive Effluent and Environmental Monitoring Programs"
CY-OC-170-201, "Compliance with Technical Specification 6.8.4 Radioactive Effluent Program"
CY-AA-170-1000, "Radiological Environmental Monitoring Program and Meteorological Program Implementation"
CY-OC-170-4160, "RGPP Scheduling and Notification for Oyster Creek Generating Station"

Condition Reports (IR)

787365, 787381, 787376, 787373, 787385, 787213787341, 787313, 787320, 787351

Other Documents

Oyster Creek Annual Radiological Environmental Operating Report (2006 and 2007)
Oyster Creek Annual Radioactive Effluent Release Report (2006 and 2007)
Program Audit NOSA-OYS-08-04, (AR 745580); "Chemistry, Radwaste, Effluent and Environmental Monitoring Audit Report"

Section 4OA1: Performance Indicator Verification

Condition Reports (IR)

776068, 772368

Other Documents

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NRC Inspection Reports 05000219/2007004, dated October 29, 2007
NRC Inspection Reports 05000219/2007005, dated January 25, 2008
NRC Inspection Reports 05000219/2008002, dated April 21, 2008
LER 2007-001-00, "Automatic Reactor Scram Following Trip of Reactor Feed Pump"
LER 2007-002-00, "Intermediate Range Monitor 16 Inoperable During Startup"
LER 2007-003-00, "Unplanned Manual Reactor Scram Following Trip of Reactor Feed Pump Due to Lowering Condenser Vacuum."

Section 4OA2: Identification and Resolution of Problems

Procedures

645.4.012, "Fire Pump Functional Test"
645.4.001, "Fire Pump 1 Operability Test"
645.4.036, "Fire Pump 2 Operability Test"
LS-AA-125, "Corrective Action Program (CAP) Procedure"
OP-OC-100-1003, "Redundant System Operability Verification Checklist"

Condition Reports (IR)

696018, 707480, 706138, 703714, 524521, 678386, 713304, 761101*

Work Orders (AR)

R2096025, C2016287, R2113282

Others

101.2, "Oyster Creek Fire Protection Program"
 Monarch Instrument Instruction Manual for Portable Stroboscopes

Section 40A5: OtherProcedures

Oyster Creek 614.1.003, "ISFSI Technical Specification Surveillance Testing"
 Oyster Creek 681.4.004, "Technical Specification Log Sheet (ISFSI)"

Other Documents

ISFSI Audit – AR 532984, NOSA-04S-06-10
 RP-OC-1001-08-007, Dated 4/15/08, "ISFSI Dose Evaluation"

LIST OF ACRONYMS

ABN	Abnormal Operating Procedure
AC	Alternating Current
ADAMS	Agency-wide Documents Access and Management System
ALARA	As Low As Reasonably Achievable
AmerGen	AmerGen Energy Company, LLC
ASME	American Society of Mechanical Engineers
ATWS	Anticipated Transient Without Scram
BTP	Branch Technical Position
CDF	Core Damage Frequency
CFR	Code of Federal Regulations
CRD	Control Rod Drive
EACE	Equipment Apparent Cause Evaluation
EMRV	Electromagnetic Relief Valve
FIN	Finding
LERF	Large Early Release Frequency
LOIA	Loss Of Instrument Air
IC	Isolation Condenser
IR	Condition Report
IST	Inservice Test
ISFSI	Independent Spent Fuel Storage Installation
IMC	Inspection Manual Chapter
IPEEE	Individual Plant Examination for External Events
NEI	Nuclear Energy Institute
NCV	Non-cited Violation
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
Oyster Creek	Oyster Creek Generating Station
PARS	Publicly Available Records
PCP	Process Control Program
PI	Performance Indicator
PMT	Post Maintenance Test
PORC	Plant Onsite Review Committee
RAP	Annunciator Response Procedure
RBCCW	Reactor Building Closed Cooling Water
RETS	Radiological Effluents Technical Specifications

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SBGT	Standby Gas Treatment System
SDP	Significance Determination Process
SLC	Standby Liquid Control
SRA	Senior Risk Analyst
SSFF	Safety System Functional Failure
UFSAR	Updated Final Safety Analysis Report
WO	Work Order