UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

November 14, 2012

EA-12-164

Mr. Michael J. Pacilio
Senior Vice President, Exelon Generation Company, LLC
President and Chief Nuclear Officer (CNO), Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: THREE MILE ISLAND STATION – NRC INTEGRATED INSPECTION REPORT 050000289/2012004 AND EXERCISE OF ENFORCEMENT DISCRETION

Dear Mr. Pacilio:

On September 30, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Three Mile Island, Unit 1 (TMI) facility. The enclosed inspection report documents the inspection results, which were discussed on October 19, 2012, with Mr. Mark Newcommer, TMI 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.

This report documents one NRC-identified finding of very low safety significance (Green). This finding 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 finding as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest any NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Three Mile Island. In addition, if you disagree with the cross-cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Resident Inspector at Three Mile Island.

Additionally, the inspectors reviewed Licensee Event Report 50-289/2011-002, which described the details associated with a failed remote shutdown relay that rendered a reactor building emergency cooling water pump discharge valve inoperable from November 10, 2011 through December 22, 2011. This issue constituted two violations of NRC requirements, in that the

licensee made the reactor critical on November 24, 2011 without the valve being operable in accordance with technical specification (TS) 3.3.1 and that the valve was inoperable for longer than its allowed outage time in accordance with TS 3.3.2. However, the NRC concluded that the cause of the failed relay, which was a manufacturing defect, was not reasonably within the licensee's ability to foresee and correct, and did not represent a performance deficiency on the licensee's part. The NRC performed a risk evaluation of the issue and determined it to be of very low safety significance. Based on these facts, I have been authorized, after consultation with the Director, Office of Enforcement, and the Regional Administrator, to exercise enforcement discretion in accordance with Section 3.5 of the Enforcement Policy and refrain from issuing enforcement for the violation.

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

We appreciate your cooperation. Please contact me at 610-337-5229 if you have any questions regarding this letter.

Sincerely,

/RA/

Darrell J. Roberts, Director
Division of Reactor Projects

Docket No: 50-289
License No: DPR-50

Enclosure: Inspection Report 05000289/2012004
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U.S. NUCLEAR REGULATORY COMMISSION
REGION 1

Docket No:	50-289
License No:	DPR-50
Report No:	05000289/2012004
Licensee:	Exelon Generation Company
Facility:	Three Mile Island Station, Unit 1
Location:	Middletown, PA 17057
Dates:	July 1 through September 30, 2012
Inspectors:	D. Werkheiser, Senior Resident Inspector J. Heinly, Resident Inspector E. H. Gray, Senior Reactor Inspector
Approved by:	G. Hunegs, Chief Reactor Projects Branch 6 Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000289/2012004; 7/1/2012-9/30/2012; Three Mile Island, Unit 1, Integrated Inspection Report; Fire Protection, Follow-up of Events and Notices of Enforcement Discretion.

The report covered a three-month period of baseline inspection conducted by resident inspectors and supporting inspections performed by a regional inspector. Inspectors identified one finding of very low safety significance (Green), which is also an NCV. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). The cross-cutting aspects for the findings were determined using IMC 0310, "Components Within Cross-Cutting Areas." 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.

Cornerstone: Mitigating Systems

Green. The inspectors identified a Green non-cited violation (NCV) of license condition DPR-50, section 2.C.(4), Fire Protection, for Exelon storing transient combustibles in excess of the fire loading allowed near the borated water storage tank (BWST). Specifically, on July 11, the inspectors identified eight bags of trash/transient combustible materials stored within 50 feet of the BWST which is in excess of the allowed fire loading in accordance with the Fire Hazards Analysis Report (FHAR) and transient combustible control program. The inspectors determined that the failure to maintain combustible loading in the BWST tunnel within the FHAR limits was a performance deficiency that was within Exelon's ability to foresee and correct. Exelon promptly removed the improperly stored transient combustibles and entered the performance deficiency into their corrective action program as issue report 1388097. Corrective actions were implemented to alert technicians of the restrictions on transient combustible materials near the BWST.

This finding was determined to be more than minor since it is similar to more than minor example 4.k of Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix E, because the fire loading was not within the FHAR limits. In accordance with Inspection Manual Chapter (IMC) 0609.04, "Phase 1 – Initial Screen and Characterization of Findings," the inspectors determined the finding affected the administrative controls for transient combustible materials. Additionally, the inspectors determined that this issue was more than minor because it affected the protection against external events attribute of the mitigating systems cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors conducted a phase 1 SDP screening using IMC 0609, Appendix F, "Fire Protection Significance Determination Process," and the inspectors determined that the finding affected the category of Fire Prevention and Administrative Controls in that combustible material was not being properly controlled, the finding had a "low" degradation rating, and the finding was of very low safety significance (Green).

This finding has a cross-cutting aspect in the area of Human Performance, Resources, because Exelon failed to appropriately ensure interdepartmental coordination during the work activities such that the transient combustibles were promptly removed from the BWST tunnel. [H.3(b)] (Section 1R05)

REPORT DETAILS

Summary of Plant Status

Three Mile Island, Unit 1 (TMI) began the inspection period at approximately 100 percent rated thermal power. On August 22, 2012, a planned unit shutdown was performed due to a leak in a pressurizer heater bundle, which was replaced during a maintenance outage. The unit also experienced an automatic reactor trip from 30 percent during the August 22 shutdown due to a condensate logic malfunction. The unit was returned to 100 percent power on September 5. On September 20, the unit experienced an automatic reactor trip due to a 'C' reactor coolant pump trip. The unit was returned to 100 percent power on September 22 and continued to operate at full rated thermal power for the rest of the inspection period.

1. REACTOR SAFETY [R]

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment (71111.04)

.1 Partial System Walkdowns (71111.04Q – 3 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- 'B' train of control room emergency ventilation on August 14, 2012
- Make-up system in low temperature overpressure mode on September 3, 2012
- Emergency feedwater pump 2B on September 13, 2012

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the Updated Final Safety Analysis Report (UFSAR), technical specifications, work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted system performance of their intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether Exelon staff had properly identified equipment issues and entered them into the corrective action program for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

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

a. Inspection Scope

On September 4, 2012, the inspectors performed a complete system walkdown of accessible portions of the 'A' low pressure injection system to verify the existing equipment lineup was correct. The inspectors reviewed operating procedures, surveillance tests, drawings, equipment line-up check-off lists, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, component lubrication and equipment cooling, hanger and support functionality, and operability of support systems. The inspectors performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. Additionally, the inspectors reviewed a sample of related issue reports and work orders to ensure Exelon appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Resident Inspector Quarterly Walkdowns (71111.05Q – 7 samples)

a. Inspection Scope

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

- Fuel handling building 348' elevation fuel pool area on July 5
- Yard 305' elevation on July 11
- Control building 338'6" elevation 1D switchgear room on July 12
- Control building 322'elevation "B" inverter room on July 23
- Air intake tunnel 281' elevation on August 2
- Reactor building fire zone 1D on August 23
- Reactor building fire zone 1E on August 30

b. Findings

Introduction. The inspectors identified a Green non-cited violation (NCV) of license condition DPR-50 section 2.C.(4), Fire Protection, for Exelon storing transient combustibles in excess of the fire loading allowed near the borated water storage tank (BWST) as specified in the TMI-1 fire hazard analysis and transient combustible control program. Specifically, on July 11, the inspectors identified eight bags of transient combustible materials stored within 50 feet of the BWST which was in excess of the

allowed fire loading in accordance with the FHAR and transient combustible control program. Exelon promptly removed the transient combustibles and entered the performance deficiency into their Corrective Action Program (CAP).

Description. In June 2012, technicians performed planned maintenance activities on equipment in the BWST tunnel. The BWST is a safety-related source of water for the engineered safeguards injection systems and is located in the yard area near the reactor building and auxiliary building. BWST level instrumentation, cable conduits and piping are routed through the large underground BWST tunnel and intersect with the auxiliary building. The work involved removal of pipe insulation in a contaminated area in the BWST tunnel and resulted in the accumulation of eight bags of trash/transient combustibles. The eight bags of transient combustibles were organized on top of sump pumps, at the base of the entrance to the BWST tunnel, and at the edge of the contaminated boundary. Specifically, the bags were located within 50 feet of the BWST, on top of sump pumps, and directly underneath the BWST level transmitters. The maintenance work group coordinated with radiation waste technicians to have the transient combustibles removed, however, the timeliness of the removal was not adequately communicated and the transient combustibles remained in the tunnel after the work was completed for nearly a month.

On July 11, 2012, the inspectors identified the transient combustible materials stored in the BWST tunnel. Specifically, eight bags of trash and protective clothing were stored within 50 feet of the safety related BWST and associated level transmitters. Exelon's FHAR and procedure OP-AA-201-009, "Control of Transient Combustible Material," Rev. 11, require that a minimum of 50 feet of separation should be provided between outdoor tanks and combustible material where feasible. The inspectors notified Exelon of the deficiency and the transient combustible material was promptly removed and documented in the CAP as IR 1388097. Corrective actions included restricting access to the BWST tunnel and posting a notification on the entry door of the requirements to maintain the area free of transient combustibles.

Analysis. The inspectors determined that the failure to maintain combustible loading in the BWST tunnel within the FHAR limits was a performance deficiency that was within Exelon's ability to foresee and correct. This finding was determined to be more than minor since it is similar to more than minor example 4.k of Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix E, because the fire loading was not within the FHAR limits. In accordance with IMC 0609.04, "Phase 1 – Initial Screen and Characterization of Findings," the inspectors determined the finding affected the administrative controls for transient combustible materials. Additionally, the inspectors determined that this issue was more than minor because it affected the protection against external events attribute of the mitigating systems cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors conducted a phase 1 SDP screening using IMC 0609, Appendix F, "Fire Protection Significance Determination Process," and the inspectors determined that the finding affected the category of Fire Prevention and Administrative Controls in that combustible material was not being properly controlled, the finding had a "low" degradation rating, and the finding was of very low safety significance (Green).

This finding has a cross-cutting aspect in the area of Human Performance, Resources, because Exelon failed to appropriately ensure interdepartmental coordination during the

work activities such that the transient combustibles were promptly removed from the BWST tunnel. [H.3(b)]

Enforcement. License condition 2.C.(4), "Fire Protection," requires that Exelon implement and maintain in effect all provisions of the approved fire protection program as described in the UFSAR. The UFSAR identifies the FHAR as the licensing basis requirements for the fire protection program. Section F.15 of the FHAR states there is to be a minimum of 50 feet of separation between the BWST and combustible materials. Contrary to the above, on July 11, 2012, NRC inspectors identified that eight bags of transient combustibles had been stored within 50 feet of the BWST for approximately one month. The inspectors notified Exelon of the deficiency and the transient combustible material was promptly removed. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program under IR 1388097, this violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy. (**NCV 05000289/2012004-01, Failure to Maintain Combustible Loading in the BWST Tunnel within FHAR Limits**).

1R06 Flood Protection Measures (71111.06 – 2 samples)

.1 Internal Flooding Review

a. Inspection Scope

The inspectors reviewed the UFSAR, the site flooding analysis, and plant procedures to assess susceptibilities involving internal flooding. The inspectors reviewed the corrective action program to determine if Exelon identified and corrected flooding problems and whether operator actions for coping with internal flooding were adequate. The inspectors reviewed documentation, barriers, and instrumentation for the auxiliary building sump area. In addition, the inspectors validated that the drainage systems were maintained to protect plant equipment required during a postulated internal flooding event.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors conducted an inspection of underground bunkers/manholes E-7 and E-9 on September 11, 2012, subject to flooding that contains cables whose failure could disable risk-significant equipment. The inspectors performed walkdowns of these risk-significant areas to verify that the cables were not submerged in water, that cables and/or splices appeared intact, and to observe the condition of cable support structures. When applicable, the inspectors verified proper sump pump operation and verified level alarm circuits were set in accordance with station procedures and calculations to ensure that the cables will not be submerged. The inspectors also ensured that drainage was provided and functioning properly in areas where dewatering devices were not installed.

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities (71111.08 – 1 sample)

a. Inspection Scope

On August 28 and 29, 2012, an onsite inspection was performed to review the upper pressurizer heater bundle leakage corrective actions including bundle replacement activities. Specifically the inspectors reviewed the upper pressurizer heater leak condition, boric acid deposit locations, the welding process for the seal weld, the replacement process including evaluation of the other two pressurizer heaters and plans for examination of the heater to pressurizer areas for leakage during plant startup. The inspection included a visual examination of the completed replacement heater seal weld root pass and confirmation of its acceptance by dye penetrant testing. The inspectors also conducted an in-office review of the design and heater configuration to determine the American Society of Mechanical Engineers component pressure boundaries.

b. Findings

No findings were identified.

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

.1 Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training for the 'B' operator crew on September 12, 2012, which included a response to an earthquake, 'A' engineered safeguards actuation system (ESAS) initation, and a major feedwater break. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the technical specification action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

.2 Quarterly Review of Licensed Operator Performance in the Main Control Room

a. Inspection Scope

The inspectors observed and reviewed main control activities on August 22, 2012 during reactor shutdown for a planned maintenance outage, including an inadvertent reactor trip due to equipment malfunction. The inspectors also observed just-in-time training in preparation for reactor start-up on August 31, 2012. The inspectors observed activities to verify that the conduct met the criteria specified in Exelon's OP-AA-1, "Conduct of Operations", Revision 000. Additionally, the inspectors observed licensed operator performance to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 2 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structures, systems, and components (SSC) performance and reliability. The inspectors reviewed system health reports, corrective action program documents, maintenance work orders, and maintenance rule basis documents to ensure that Exelon was identifying and properly evaluating performance problems within the scope of the maintenance rule. For each sample selected, the inspectors verified that the SSC was properly scoped into the maintenance rule in accordance with 10 CFR 50.65 and verified that the (a)(2) performance criteria established by Exelon staff was reasonable. As applicable, for SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a)(2). Additionally, the inspectors ensured that Exelon staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

- Safety system performance indicator goal exceeded for emergency diesel generators, July 6, 2012 (IR 1386021)
- 'A' nuclear river water pump increase in vibrations on September 6, 2012

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that Exelon performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that Exelon

personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When Exelon performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the technical specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- SW-P-1A/B removed from service for minor maintenance weld repair on July 11-12, 2012
- Issuance of maximum emergency generation action by electrical grid independent system operator on July 17, 2012
- Shutdown risk profile for maintenance outage T1M07 on August 22-24, 2012
- DH-V-4B removed from service for a electrical modification on September 27, 2012

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15 – 3 samples)

a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions:

- Compensatory actions for missing flood seals in air intake tunnel (IR 13995510) on August 13, 2012
- 'A' building spray pump inboard bearing seal plate leakage (IR 1399637) on August 14, 2012
- Station black-out and emergency diesel engine lubricant compatibility (IR 1400568, 1400569, 1400571) on August 21, 2012

The inspectors selected these issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the operability determinations to assess whether technical specification operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the technical specifications and UFSAR to Exelon's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled by Exelon. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

No findings were identified.

1R19 Post Maintenance Testing (71111.19 – 5 samples)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed the test procedure to verify that the procedure adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure was consistent with the information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed the test or reviewed test data to verify that the test results adequately demonstrated restoration of the affected safety functions.

- E-21, Thermal Overload Device Inspection and Test, after replacement of AH-E-9A/B motor overloads on July 10, 2012
- 1303-11.13, Control Room Filtering System Test and U-36, Ventilation Filter DOP and Halide Testing, after CB emergency ventilation filter replacement on July 16-17, 2012
- C2027883, Repair Actuator Housing Leak, after MS-V-3A accumulator inspection and leak repair on August 6, 2012
- C2310468, Replace missing mounting bolts for 'B' control building emergency supply fan [AH-E-18B] support frame on August 16, 2012
- C2009219, Post maintenance testing of the heater circuit after the replacement of the pressurizer heater bundle assembly on August 31, 2012

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 – 2 samples)

.1 Maintenance Outage to Replace Upper Pressurizer Heater Bundle (T1MO7)

a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the Unit 1 maintenance outage (T1MO7), which was conducted August 22 through September 4, 2012. The inspectors reviewed Exelon's development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. During the outage, the inspectors observed portions of the shutdown, cooldown, pressurizer heater replacement, heatup, and startup processes and monitored controls associated with the following outage activities:

- Post-trip response and pre-startup verification
- Configuration management, including maintenance of defense-in-depth, commensurate with the outage plan for the key safety functions and compliance with the applicable technical specifications when taking equipment out of service

- Implementation of clearance activities and confirmation that tags were properly hung and that equipment was appropriately configured to safely support the associated work or testing
- Configuration and control of reactor coolant pressure, level, and temperature instruments to provide accurate indication and instrument error accounting
- Status and configuration of electrical systems to ensure that technical specifications were met
- Inspection of pressurizer heater penetration areas
- Replacement of upper pressurizer heater bundle
- Inspection of middle pressurizer heater seal area
- Monitoring of decay heat removal operations
- Reactor water inventory controls, including flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss during pressurizer heater replacement
- Activities that could affect reactivity and shutdown margin requirements
- Maintenance of secondary containment as required by technical specifications
- Fatigue management
- Identification and resolution of problems related to outage activities

b. Findings

No findings were identified.

.2 Forced Outage due to 'C' RCP trip (T1FO8)

a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the Unit 1 forced outage (T1FO8), which was conducted September 20-22, 2012. The inspectors reviewed Exelon's development and implementation of troubleshooting and forced-outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. During the forced outage, the inspectors observed portions of the plant stabilization to hot-standby, repairs, and startup processes and monitored controls associated with the following outage activities:

- Post-trip response and pre-startup verification
- Configuration management, including maintenance of defense-in-depth, commensurate with the forced outage plan for the key safety functions and compliance with the applicable technical specifications when taking equipment out of service
- Implementation of clearance activities and confirmation that tags were properly hung and that equipment was appropriately configured to safely support the associated work or testing
- Status and configuration of electrical systems and switchgear activities to ensure that technical specifications were met
- Troubleshooting, repair, equipment monitoring activities related to reactor coolant pump motor operations
- Fatigue management
- Identification and resolution of problems related to outage activities

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 6 samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs to assess whether test results satisfied technical specifications, the UFSAR, and Exelon procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

- 1303-4.2C, RPS Channel C CRD Breaker and Test Module Testing on July 3, 2012
- OP-TM-220-251, RCS Leak Rate Determination on July 6, 2012 (leak rate)
- OP-TM-424-213, IST of CO-V-14S and CO-V-111S on August 9, 2012 (in-service test)
- OP-TM-213-211, Pressure Isolation Test of CF-V-14A, CF-V5A, and DH-V-22A on August 22, 2012 (containment isolation valve)
- OP-TM-212-240, Data Collection for IST of DH-V-1 and DH-V-2 During Plant Cooldown on August 23, 2012 (in-service test)
- 1303-9.9, Hydraulic Snubber Functional Testing and Seal Replacement on August 23, 2012

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06 - 1 sample)

a. Inspection Scope

The inspectors evaluated the conduct of emergency event identification, classification, and notification during licensed operator requalification simulator training for a design basis earthquake on September 12, 2012. Exelon planned for this evolution to be evaluated and included in performance indicator data regarding drill and exercise performance. The inspectors also attended the post-evolution critique for the scenario. The focus of the inspectors' activities was to note any weaknesses and deficiencies in the crew's performance and ensure that Exelon's evaluators noted the same issues and entered them into the corrective action program.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES [OA]

4OA1 Performance Indicator Verification (71151)

.1 Safety System Functional Failures (1 sample)

a. Inspection Scope

The inspectors sampled Exelon's submittals for the Safety System Functional Failures performance indicator for Unit 1 for the period of October 1, 2011, through June 30, 2012. To determine the accuracy of the performance indicator data reported during those periods, inspectors used definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 10 CFR 50.73." The inspectors reviewed Exelon's operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, condition reports, event reports and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index (5 samples)

a. Inspection Scope

The inspectors reviewed Exelon's submittal of the Mitigating Systems Performance Index for the following systems for the period of October 1, 2011 through June 30, 2012:

- [MS 06] Emergency AC Power System (Emergency Diesel Generators)
- [MS 07] High Pressure Safety Injection System (Makeup)
- [MS 08] Emergency Feedwater System
- [MS 09] Decay Heat Removal
- [MS 10] Cooling Water Support Systems (Decay Closed, Decay River, Nuclear Closed, Nuclear River)

To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors also reviewed Exelon's operator narrative logs, condition reports, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals. Documents reviewed include LS-AA-2200, MSPI Data Acquisition and Reporting, Rev. 3, issue reports 1396429, 1281920, and 1281901.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152 – 1 annual sample)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that Exelon entered issues into the corrective action program at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the corrective action program and periodically attended issue report screening meetings.

b. Findings

No findings were identified.

.2 Annual Sample - Maintenance Procedure Upgrade Project (1 sample)

a. Inspection Scope

Independent assessments (e.g., NRC, industry peer groups) in late 2010 and the first half of 2011 identified TMI maintenance procedure quality and adherence deficiencies. Exelon documented the concern in IR 1203015 and performed a multi-disciplined root cause evaluation (RCE). The RCE confirmed that industry best practices and procedure upgrades were not incorporated in existing maintenance procedures. Specifically, the station lacked component specific maintenance procedures for critical plant equipment. Based on the RCE findings, the station established a procedure upgrade program targeted at critical component maintenance activities and creating component specific procedures for those activities.

The inspectors independently reviewed the procedure upgrade project to ensure procedure quality improved, the scope and depth of corrective actions was commensurate with the procedural and adherence deficiencies identified and that the corrective actions are completed in a timely manner. Specifically, the inspectors independently reviewed surveillance test procedures for calibration of instrumentation and control equipment and maintenance procedures for instrument air and vacuum pump planned maintenance activities. The review was performed to evaluate procedure adequacy to support worker procedure adherence and station identification of problems encountered while performing the selected test procedures. The inspectors also reviewed a risk informed sample of maintenance procedure-related issue reports written during the last two years to determine whether identified problems were properly corrected.

The inspectors assessed Exelon's problem identification threshold, cause analyses, extent-of-condition reviews, compensatory actions, and the prioritization and timeliness of corrective actions to determine whether Exelon was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of Exelon's corrective action program and 10 CFR Part 50, Appendix B. In addition, the inspectors performed field walkdowns and interviewed engineers, technicians, and managers to assess the effectiveness of the implemented corrective actions. Documents reviewed are listed in the Attachment.

b. Findings and Observations

No findings were identified.

Exelon developed a multi-discipline project team to replace generic maintenance procedures with component specific procedures for over 500 components and training for first line supervisors on procedure quality, procedure adherence fundamentals, and supervisors' responsibility for enforcement of procedure adherence. The inspectors performed a risk informed sample review of completed component specific procedures to ensure technical accuracy and that they were documented in accordance with quality standards as required by Exelon procedure, LS-AA-101-1000, License Amendment and Technical Specifications Change Request Process, Rev. 009. The inspectors determined that the procedures maintained technical accuracy and that the procedures were documented with industry best standards to minimize human performance events.

In addition, the inspectors sampled in-field maintenance and calibration activities governed by new component specific procedures. Specifically, the inspectors observed technicians perform maintenance activities on instrument air compressor 4 (IA-P-4) and vacuum pump 2C (VA-P-2C), and a reactor coolant temperature channel (RC4A-TE-1) in accordance with their new component specific procedure. The inspectors reviewed the maintenance technicians detailed procedure mark-ups and clarification comments to improve the procedure quality. The inspectors validated that the technicians entered the issues into the corrective action program. Also, the inspector's review of past IRs determined that the deficiencies identified were addressed during the development of the new procedures. The inspectors identified no inadequacies in the execution and critique of the new component specific procedures. The procedures provided adequate guidance to perform the maintenance activity and the maintenance technicians provided practical feedback to further improve procedure quality.

4OA3 Follow-up of Events and Notices of Enforcement Discretion (71153 – 5 samples)

.1 Plant Events

a. Inspection Scope

For the plant event listed below, the inspectors reviewed and/or observed plant parameters, reviewed personnel performance, and evaluated performance of mitigating systems. The inspectors communicated the plant events to appropriate regional personnel, and compared the event details with criteria contained in IMC 0309, "Reactive Inspection Decision Basis for Reactors," for consideration of potential reactive inspection activities. As applicable, the inspectors verified that Exelon made appropriate

emergency classification assessments and properly evaluated reportability of the event in accordance with 10 CFR Parts 50.72 and 50.73. The inspectors performed independent walkdowns and reviewed Exelon's follow-up actions related to the event to assure that Exelon implemented appropriate corrective actions commensurate with their safety significance. Documents reviewed are listed in reference sections 1R20 and 4OA3 in the attachment.

- TS required shutdown for reactor coolant system boundary leakage as reported in Event Notification (EN) 48220 on August 22, 2012
- Automatic reactor trip on high reactor coolant pressure as reported in EN 48221 on August 22, 2012
- Automatic reactor trip resulting from the trip of the 'C' reactor coolant pump as reported in EN 48325 on September 20, 2012

b. Findings

No findings were identified.

.2 (Closed) Licensee Event Report (LER) 05000289/2011-002-00: Remote Shutdown Relay 69X1RR Contact Failure

On December 22, 2011, the reactor building emergency cooling water pump discharge valve "B" (RR-V-1B) failed to open during performance of an engineered safeguards actuation system (ESAS) quarterly surveillance test. TMI declared RR-V-1B inoperable and entered a 72 hour limited condition for operation (LCO) in accordance with technical specification (TS) 3.3.2. TMI performed troubleshooting and determined that the remote shutdown (RSD) transfer selector switch relay (69X1RR), which is in series with the ESAS signal, exhibited intermittent contact make-up. The function of the RSD selector switch and associated relay (69X1RR) is to transfer control of RR-V-1B from the main control room to the RSD panel. The relay (69X1RR) was found in the open-state thus, inhibiting the ESAS actuation signal. The selector switch relay was cycled until proper contact make-up was achieved. TMI applied administrative controls to ensure the transfer switch relay (69X1RR) contact closed properly if the RSD transfer switch was manipulated prior to the relay replacement. RR-V-1B was successfully tested and declared operable on December 22, 2011. The relay transfer switch was replaced and tested satisfactorily on January 6, 2012.

The last successful RSD functional test of RR-V-1B had been completed on November 10, 2011 during refueling outage T1R19. TMI concluded that the relay (69X1RR) had most likely not fully re-closed at the completion of the test. Thus, TMI determined that RR-V-1B was inoperable from November 10, 2011 through December 22, 2011.

This issue constituted two violations of NRC requirements. Namely, a) the licensee made the reactor critical on November 24, 2011 (while starting up from T1R19), without all engineered safeguards valves associated with the reactor building emergency cooling system being operable as required by TS 3.3.1; and, b) and that RR-V-1B was inoperable for more than 72 hours, and the unit wsa no paced in a hot shutdown condition within 6 hours, as required by TS 3.3.2. However, the NRC concluded that it was not reasonably within the licensee's ability to foresee and correct the relay failure that caused these violations. Specifically, the failure analysis of the relay identified that

an unforeseen manufacturing defect caused the failure and that the relay exhibited no visual abnormalities or indications to the licensee that a defect existed prior to its failure. In addition, the NRC identified that no significant plant or industry operating experience existed on this style relay that would have alerted the licensee to this potential issue. Therefore, the NRC did not identify any performance deficiency associated with the violations.

Inspection Manual Chapter (IMC) 0612, Appendix B, "Issue Screening," directs disposition of this issue in accordance with the Enforcement Policy because there was no performance deficiency associated with the violations. The inspectors used the enforcement policy, Section 6.1, "Reactor Operations," to evaluate the significance of this violation. The inspectors concluded that the violation is more than minor and best characterized as Severity Level IV (very low safety significance) because it is similar to Enforcement Policy Section 6.1, example d.1. Additionally, the inspectors assessed the risk associated with the issue by using IMC 0609, Appendix A, "SDP For Findings at Power." The inspectors screened the issue, and evaluated it using Exhibit 3 of IMC 0609, Appendix A. Evaluating the criteria under the Barrier Integrity cornerstone, the finding did not represent an actual open pathway in the physical integrity of the containment and did not involve a reduction in function of hydrogen igniters in the reactor containment. Based on these reviews, the issue would screen as very low safety significance (Green).

Because it was not reasonable for TMI to have been able to foresee and prevent the relay failure, the NRC determined no performance deficiency existed. Thus, the NRC has decided to exercise enforcement discretion in accordance with Section 3.5 of the NRC Enforcement Policy and refrain from issuing enforcement action for the violation (EA-12-164). Further, because the licensee's action and/or inaction did not contribute to this violation, it will not be considered in the assessment process or the NRC's Action Matrix. This LER is closed.

.3 (Closed) LER 05000289/2012-001-00: Single Condition Making Independent Trains Inoperable

On May 9, 2012, Exelon identified, while responding to questions by the inspectors and the NRC project manager regarding TMI's response to operating experience (OE) 30225, that the station's response would require revision and additional corrective actions to address vulnerabilities in the heat sink protection system (HSPS) anticipatory actuation system. Specially, the TMI response to the OE was inadequate and failed to recognize the possibility that this function may be inoperable while a single main feed pump is running and the second main feed pump is not operating, but reset. The licensee entered this into the corrective action program as IRs 1364596 and 1376645, implemented immediate changes to station procedures, and are evaluating additional modifications. The licensee's identified six occurrences in the past three years where this condition existed, two of which exceeded one hour in duration. The inspectors considered these two occurrences a violation of HSPS TS 3.5.1.1 and 3.5.1.9, in that actions were not taken within one hour to restore one train of HSPS to service. However, the inspectors considered this finding constitutes a violation of minor significance because the required action time was not exceeded nor did the finding prevented the emergency feedwater system from performing its safety function and therefore not subject to enforcement action in accordance with the NRC's Enforcement Policy. No new findings were identified in the inspector's review. This LER is closed.

4OA5 Other Activities

.1 Temporary Instruction 2515/187 – Inspection of Near-Term Task Force Recommendation 2.3 – Flooding Walkdowns

On July 24, 2012, inspectors commenced activities to independently verify that Exelon conducted external flood protection walkdown activities using an NRC-endorsed walkdown methodology. These flooding walkdowns are being performed at all sites in response to Enclosure 4 of a letter from the NRC to licensees entitled, "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," dated March 12, 2012 (ADAMS Accession No. ML12053A340). The results of this temporary instruction will be documented in a future inspection report.

.2 Temporary Instruction 2515/188 – Inspection of Near-Term Task Force Recommendation 2.3 – Seismic Walkdowns

On August 13, 2012, inspectors commenced activities to independently verify that Exelon conducted seismic walkdown activities using an NRC-endorsed seismic walkdown methodology. These seismic walkdowns are being performed at all sites in response to Enclosure 3 of a letter from the NRC to licensees entitled, "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," dated March 12, 2012 (ADAMS Accession No. ML12053A340). When complete, the results of this temporary instruction will be documented in a future inspection report.

.3 Correction to Previous Report

In report 05000289/2012003, Section 4OA5.1, regarding closure of URI 05000289/2011004-04, the report incorrectly documented the TMI flooding reevaluation due date as March 12, 2012. The correct due date is March 12, 2013 (ADAMS Accession No. ML12097A509).

4OA6 Meetings, Including Exit

Quarterly Inspection Report Exit

On October 19, 2012, the inspectors presented the inspection results to Mr. Mark Newcomer, Plant Manager, Three Mile Island and other members of the Three Mile Island staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

T. Alvey	Operations Support
D. Atherholt	Manager, Regulatory Assurance
Seth Baker	Seismic Contractor
P. Bennett	Manager, Design Engineering - Mechanical
R. Brady	Shift Manager
W. Carsky	Director, Site Engineering
J. Cavanaugh	Engineer
D. Divittore	Manager, Site Radiation Protection
Mark Etre	Seismic Contractor
M. Fitzwater	Senior Regulatory Assurance Engineer
T. Flemming	System Engineer
J. Grove	Senior Regulatory Specialist
T. Haaf	Director, Site Operations
R. Campbell	Manager, Site Security
D. Lewis	Control Room Supervisor
R. Libra	Site Vice President
Juan Lopez-Ferrer	System Engineer
R. Masoero	System Engineer-Inservice Testing Program Owner
G. McCarty	Manager, RP Technical Support
W. McSorley	Flood Protection Engineer
R. Myers	Fire Marshall
G. Navratril	Engineer
Ted Noble	Seismic Contractor
J. Piazza	Senior Manager, Design Engineering
J. Popielarski	Work Management Director
J. Schork	Training Instructor/Shutdown Safety Manager
C. Six	Operations Superintendent
J. Stubbs	Work Control Supervisor
S. Taylor	Fire Protection Engineer
B. Young	Manager, Instrumentation and Control Department

Other

D. Dyckman	Nuclear Safety Specialist, Pennsylvania Department of Environmental Protection, Bureau of Radiation Protection
P. Bamford	TMI-1 Project Manager, USNRC Nuclear Reactor Regulation

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Open / Closed		
05000289/2012004-01	NCV	Failure to Maintain Combustible Loading in the BWST Tunnel within FHAR Limits (Section 1R05)
Closed		
05000289/2011-002-00	LER	Remote Shutdown Relay 69X1RR Contact Failure (Section 4OA3.2)
05000289/2012-001-00	LER	Single Condition Making Independent Trains Inoperable (Section 4OA3.3)

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

Procedures

OP-TM-211-101, Shifting MU System from Shutdown to Low Temperature Overpressure Mode, Rev. 9
OP-TM-212-000, Decay Heat Removal System, Rev. 15
OP-TM-212-191, Shifting DHR Trains A and B from DHR Standby to ES Standby, Rev. 8A
OP-TM-424-000, Emergency Feedwater System, Rev. 11

Drawings

302-082, Emergency Feedwater Flow Diagram, Rev. 24
302-101, Condensate Flow Diagram, Rev. 65
302-640, Decay Heat Removal Flow Diagram, Rev. 84
4692-51-120-1-0, Control Room Emergency Ventilation, Rev. 5

Other

ECRs: 02-00263-000 (A), 02-00271-000 (B), 02-00272-000 (C)
ES-022T, TMI Seismic Criteria
IRs: 1400723, 1400762
Past Operability Evaluation for AH-E-18B, dated 9/13/12
UFSAR Section 9.8.1.4

Section 1R05: Fire Protection

Procedures

1038, Administrative Controls – Fire Protection Program, Rev. 76
CC-AA-309-101, Engineering Technical Evaluations, Rev. 11
CC-MA-209-1002, Combustible Loading Database Control for Oyster Creek and Three Mile Island, Rev. 0
MA-AA-716-026, Station Housekeeping/Material Condition Program, Rev. 10
OP-AA-201-009, Control of Transient Combustible Material, Rev. 11
OP-MA-201-007, Fire Protection System Impairment Control, Rev. 6

Other

Fire Hazards Analysis Report, Rev. 25
IRs 1388097, 1411335
Work Order C2027015, M2305238, R1832451

Section 1R06: Flood Protection Measures

Procedures

OP-TM-AOP-060, Leakage While on Decay Heat Removal, Rev. 6
OP-TM-LWDS-0101, Aux Building Sump Level Above Normal, Rev. 1
OP-TM-232-530, Pumping the Auxiliary Building Sump to the MWST, Rev. 2
MA-TM-153-001, Inspection and Maintenance of TMI-1 Electrical and Telephone Manholes, Rev. 3

Other

IRs	1398329	1404787				
WO	C1117428	R1834332	R2070975	R2203301	R2203718	R2191888

Section 1R08: Inservice Inspection Activities

Procedures

Welding Procedure Specification WP8/43/F43AW1-012, dated 4/6/2012

Drawings

129283, Heater Bundle Assembly & Details, Rev. 10

Other

AR 01407360, 01403662
Areva Document 51-5037476-00, TMI Pressurizer Heater Evaluation
CR2012-6492
Doc # 03-5037430, TMI Pressure Heater Bundle Removal and Installation, Rev. 004
Letter dated 8/24/2012, DJSkulina to JPiazza on TMI Presurizer Heater Bundle Ligament and Condition Report 2011-271

Section 1R11: Licensed Operator Requalification

Procedures

OP-TM-AOP-003, Earthquake, Rev. 3

Other

IC-16 (74), Simulator Initial Condition
IR 1407393
TQ-TM-LRU-106-S031, TMI Operational Simulator Exam Scenario, Rev. 0

Section 1R12: Maintenance Effectiveness

Procedures

ER-AA-310, Implementation of the Maintenance Rule, Rev. 8
OP-TM-541-000, Primary Component Cooling, Rev. 16

Other

IRs	1122211	1162196	1183436	1347798	1349414	1360370
	1375469	1376106	1376126	1409750	1412100	1413452
	1413037					

TMI Business Plan O.6 Indicator

WO	R2101457

Section 1R13: Maintenance Risk

Procedures

1082.1, TMI Risk Management Program, Rev. 8

1104-33, Screen House Equipment, Rev. 43
1107-11, TMI Grid Operations, Rev. 26
OP-AA-108-107-1001, Station Response to Grid Capacity Conditions, Rev. 4
OP-AA-108-117, Protected Equipment Program, Rev. 2
WC-AA-101, On-Line Work Control Process, Rev. 18A

Other
IRs 1387740 1389933 1419132
Shutdown Safety Summaries, dated August 22 – September 4, 2012
WO M2307623 C2028222

Section 1R15: Operability Evaluations
Procedures
MA-TM-122-901, Install U1 Flood Barriers, Rev. 4
OP-AA-108-115, Operability Determinations, Rev. 10
OP-AA-108-115-1002, Supplemental Consideration for On-Shift Immediate Operability Determinations, Rev. 2
OP-TM-214-000, Building Spray System, Rev. 8

Drawings
SS 200-61201

Other
IR 1364232
Technical Evaluation A2051830-75
TS LCO 3.3.1.3.a, 3.3.2, 4.5.4

Section 1R19: Post Maintenance Testing
Procedures
1450-023, Pressurizer Heater Groups (8-9) Undervoltage Relay Maintenance, Rev. 9
MA-AA-716-012, Post Maintenance Testing, Rev. 16
OP-TM-220-206, Pressurizer Heaters Emergency Power Functional Test, Rev. 2

Drawings
302-011, Main Steam Flow Diagram, Rev. 73
4W-69819, BL-Aerofoil Fans Single Inlet Arrangement No. 1, Sheet 1, Rev. 0

Other
AR A2218773 A2310468
IRs 1397436 1397874 1398656 1398615 1398592 1398494 1398379 1388345 1407500 1408202 1408023 1407931 1408023
WO C2027216 C2027883 R2138720 R2162752
ECR 04-00675, Replace Upper PZR Heater Bundle, Rev. 1

Section 1R20: Refueling and Outage Activities
Procedures
1101-3, Containment Integrity and Access Limits, Rev. 91
1102-2, Plant Startup, Rev. 153
1102-10, Plant Shutdown, Rev. 97A
1102-11, Plant Cooldown, Rev. 142B

1103-8, Approach to Criticality, Rev. 53
1103-11, RCS Water Level Control, Rev. 69
OP-AA-108-108, Unit Restart Review, Rev. 12
OP-AA-108-108-1001, Drywell/Containment Closeout, Rev. 1
OP-AA-108-108-1008, TMI-1 Supplement to OP-AA-108-108, Rev. 11
OP-TM-220-251, RCS Leak Rate Determination, Rev. 10
OP-TM-220-261, Reactor Coolant System VT-2 Exam, Rev. 8
OP-TM-300-205, Shutdown Margin for Hot Shutdown Conditions, Rev. 2
OP-TM-300-206, Shutdown Margin for Low Temperature Conditions, Rev. 1
OP-TM-311-102, Standby Mode to Operating Mode, Rev. 2
OP-TM-EOP-001, Reactor Trip, Rev. 11
OP-TM-EOP-004, Lack of Primary to Secondary Heat Transfer, Rev. 9
OP-TM-EOP-030, Loss of Decay Heat Removal, Rev. 4
OP-TM-EOP-010, Emergency Procedures Rules, Guides and Graphs, Rev. 15

Drawings
129283, Heater Bundle Assembly & Details, Rev. 10
SS-208-103, Electrical Elementary Diagrams 6900V Switchgear, Rev. 3

IRs

1403278	1404319	1407500*	1408607*
1403366	1404676	1407931	1410032*
1403380	1405512	1407941	1416065
1403397	1405751	1407967	1416103
1403466	1406164	1407969	1416507
1403602	1406579	1408045	1416717
1403669	1406703	1408229	1418180
1404251	1407358	1408517	1418181

(*) IRs generated as a result of inspection.

Other
1102-11, Cooldown Data Sheets, dated August 24, 2012
Event Notification #48220, dated August 22, 2012
Event Notification #48221, dated August 22, 2012
Event Notification #48325, dated September 20, 2012
PORC 2012-18 Meeting Minutes, dated September 1, 2012
Post-Transient Review, dated August 28, 2012
Post-Transient Review, dated September 21, 2012
TS 3.1.6, Leakage, Amendment 271
T1MO7 Shutdown Safety Plan
T1MO7 Dose Plan
T1FO8 Forced Outage Plan, dated September 21, 2012
TMI-1 Shift Operations Logs, dated August 22 – September 5, 2012
TMI-1 Shift Operations Logs, dated September 20-25, 2012
TMI Maintenance Timeline, dated September 20, 2012
Troubleshooting/Refute List for RC-P-1C Tripped, dated September 21, 2012
Radiological Survey Diagram of Removed Upper Pressurizer Bundle, 1RB515, 12-04823
VT-2 Exam of Installed Pressurizer Heater, WO R2113191, Dated September 3, 2012

Section 1R22: Surveillance Testing

Procedures

1301-9.9, Hydraulic Snubber Visual Inspection, Rev. 56
1410-Y-34, Hydraulic Snubber Maintenance, Rev. 33

Other

WO	R2200822	R2186999	R2201610	C2028269	R2044044
IR	1403542	1388833	1367732		

Section 1EP6: Drill Evaluation

Procedures

OP-TM-AOP-003, Earthquake, Rev. 3
WC-TM-430, Surveillance Testing Program, Rev. 0
WC-430-1001 Surveillance Testing Program Database Interface and Maintenance, Rev. 1

Other

EAL HA4 – Earthquake
EAL HU4 – Earthquake
IC-16(74), Simulator Initial Condition
TQ-TM-LRU-106-S031, TMI Operational Simulator Exam Scenario, Rev. 0

Section 4OA2: Identification and Resolution of Problems

Procedures

IC-3, RTD Temperature Loop Calibration and Repair, Rev. 17
MA-141-212, Calibration of SP10B-PT-1, Rev. 0
MA-TM-133-008, Atlas Copco Air Compressor, Rev. 0
MA-TM-134-144 VA-P-2C Vacuum Pump, Rev. 0
MA-TM-145-201, Calibration of RC4A-TE-1 Reactor Coolant Temperature to ICS/NNI, Rev. 0a
MA-TM-145-202, Calibration of RC4A-TE-4 Reactor Coolant Temperature to ICS/NNI, Rev. 0a
MA-TM-145-203, Calibration of RC4B-TE-1 Reactor Coolant Temperature to ICS/NNI, Rev. 0
MA-TM-145-202, Calibration of RC4B-TE-4 Reactor Coolant Temperature to ICS/NNI, Rev. 0

Other

IRs	1203015	1417944	1425516

WO R2157545

Section 4OA3: Follow-up of Events and Notices of Enforcement Discretion
(In addition to references listed in section 1R20 above)

Procedures

1303-5.2B, “B” Emergency Loading Sequence and HPI Logic Channel/Component Test

Other

Apparent Cause Report, EACE for “B” Remote Shutdown Relay 69X 1RR Contact Failure
IR 1306045, 1326727, 1327076, 1328637, 1356594, 1356594
Log Entries Report 12/22/2011
Work Order C2026861

LIST OF ACRONYMS

AC	Alternating Current
ADAMS	Agencywide Documents and Management System
BWST	Borated Water Storage Tank
CAP	Corrective Action Program
CFR	Code of Federal Regulations
DRP	Division of Reactor Projects
ECR	Engineering Change Request
EN	Event Notification
ESAS	Engineered Safeguards Actuation System
FHAR	Fire Hazard Analysis Report
HSPS	Heat Sink Protection System
IMC	Inspection Manual Chapter
IR	Issue Report
IST	Inservice Testing
LCO	Limiting Condition for Operation
LER	Licensee Event Report
NCV	Non-cited Violation
NEI	Nuclear Engineering Institute
NRC	Nuclear Regulatory Commission
OE	Operating Experience
PADEP	Pennsylvania Department of Environmental Protection
PARS	Publicly Available Records
RCE	Root Cause Evaluation
RSD	Remote Shut Down
SDP	Significance Determination Process
SER	[NRC] Safety Evaluation Report
SSC	Structures, Systems and Components
ST	Surveillance Test
TMI	Three Mile Island, Unit 1
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report