



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

July 28, 2010

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, UNIT 1 – NRC INTEGRATED  
INSPECTION REPORT 5000289/2010003

Dear Mr. Pacilio:

On June 30, 2010, the U. S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Three Mile Island, Unit 1 (TMI) facility. The enclosed inspection report documents the inspection results, which were discussed on July 21, 2010, with Mr. William Noll and other members of your staff.

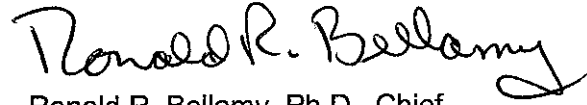
The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

On the basis of the results of this inspection, no findings of significance were identified. However, a licensee identified violation which was determined to be of very low safety significance is listed in this report. Because of the very low safety significance of the violation and because it is entered into your corrective action program, the NRC is treating this violation as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest this non-cited violation, 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 20555-001; and the NRC Resident Inspector at Three Mile Island

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

Sincerely,



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

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

Enclosure: Inspection Report 05000289/2010003  
w/Attachment: Supplemental Information

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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: 50-289  
License No: DPR-50

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U.S. NUCLEAR REGULATORY COMMISSION  
REGION 1

Docket No: 50-289

License No: DPR-50

Report No: 05000289/2010003

Licensee: Exelon Generation Company

Facility: Three Mile Island Station, Unit 1

Location: Middletown, PA 17057

Dates: April 1 through June 30, 2010

Inspectors: D. Kern, Senior Resident Inspector  
J. Brand, Resident Inspector  
S. Barr, Senior Emergency Preparedness Specialist  
C. Crisden, Emergency Preparedness Specialist  
M. Balazik, Reactor Inspector  
R. Nimitz, Senior Health Specialist

Approved by: R. Bellamy, Ph.D., Chief  
Projects Branch 6  
Division of Reactor Projects (DRP)

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**SUMMARY OF FINDINGS**

IR 05000289/2010003; 4/1/2010-6/30/2010; Exelon Generation Company, LLC; Three Mile Island, Unit 1, integrated report.

The report covered a three-month period of baseline inspection conducted by resident inspectors and announced inspections by regional specialist inspectors. No findings of significance were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, Reactor Oversight Process, Rev. 4, dated December 2006.

## REPORT DETAILS

### Summary of Plant Status

Three Mile Island, Unit 1 (TMI) began the inspection period at approximately 100 percent rated thermal power. On May 28, operators performed a planned shutdown in response to lowering 'B' reactor coolant pump (RCP) upper bearing lubricating oil level (Issue report [IR] 1037870) and flow degradation on the 'A' cooling tower (CW-C-1A, IR 1073479). Operators returned the plant to full power on May 31, following repair of a leaking weld on a flange to the 'B' RCP lube oil heat exchanger (RC-C-1B, IR 1075511) and repair of a severed 36 inch man-way in the 'A' cooling tower main return header. The plant operated at approximately 100 percent power for the remainder of the inspection period.

#### 1. REACTOR SAFETY

##### **Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity**

1R01 Adverse Weather Protection (71111.01 – 2 samples)

#### .1 Power Grid Reliability: Readiness of Offsite and Alternate AC Power Systems

##### a. Inspection Scope

The inspectors verified plant features and procedures for continued operation and reliability of the offsite power grid and onsite alternate AC power systems during adverse weather (i.e., thunderstorms and hot weather extremes). Reviews included station procedures affecting operation of onsite electrical generation sources and communication protocols between control room operators and the transmission system operator to verify appropriate information is exchanged when issues arise that could impact the offsite power system. The inspectors reviewed IRs 1077262 and 1077965 which evaluated spurious alarms on the 'A' auxiliary transformer to verify the issue was properly evaluated and that operability of the transformer was not affected. The inspectors reviewed the main and auxiliary transformers system health reports for the period April 1 through June 30, 2010. The inspectors interviewed station personnel, reviewed equipment maintenance and corrective action program records, and performed in-plant walkdowns to physically verify the material condition, readiness of the offsite electrical transformers, and readiness of onsite emergency diesel generators. Additional documents reviewed are listed in the Attachment.

##### b. Findings

No findings of significance were identified.

#### .2 Dike/Flood Control System

##### a. Inspection Scope

The inspectors reviewed Exelon's external flooding mitigation strategy including applicable sections of the Updated Final Safety Analysis Report (UFSAR) and historic issue reports. The inspectors reviewed station surveillance procedure 3301-SA1, Dike

Inspection, Rev. 13 which was completed by the licensee on May 27, 2010, to determine the condition of the flood barrier and whether repairs were needed. In addition, the inspectors walked down the intake screen house which houses the fire protection system pumps and safety related cooling water pumps for the decay heat removal system, nuclear service water system, and reactor river water system. Documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

a. Inspection Scope

Partial System Walkdowns (71111.04Q – 4 samples)

The inspectors performed four partial system walkdown samples on the following systems and components:

- On April 16, the inspectors walked down the 'B' and 'C' nuclear river (NR) cooling water pumps (NR-P-1B and 1C) while the 'A' NR cooling water pump was out of service for a planned maintenance activity and subsequent post maintenance testing;
- On May 25, the inspectors walked down the 'A' emergency diesel generator (EG-Y-1A) while the station blackout diesel generator (EG-Y-4) was out of service for a planned maintenance outage;
- On May 26, the inspectors walked down the 'B' emergency diesel generator (EG-Y-1B) while the station blackout diesel generator (EG-Y-4) was out of service for a planned maintenance outage; and
- On June 1-2, the inspectors walked down the 'A' and 'B' high pressure injection trains during a planned maintenance outage on the 'A' makeup pump (MU-P-1A). This configuration required realignment of MU-P-1B to the 'A' high pressure injection train.

The partial system walkdowns were conducted to ensure redundant trains and standby equipment relied on to remain operable for accident mitigation were properly aligned.

Complete System Walkdown (71111.04S – 1 sample)

From June 1 thru 24, the inspectors performed one complete system walkdown sample on the 'B' motor driven emergency feedwater pump (EF-P-2B) and the turbine driven emergency feedwater pump (EF-P-1) during a planned maintenance outage on the 'A' makeup pump (MU-P-1A) and the 'A' motor driven emergency feedwater pump (EF-P-2A). The inspectors conducted a detailed review of the alignment and condition of the system using piping and information diagrams and evaluated open corrective action program reports for impact on system operation. In addition, the inspectors reviewed the



associated protected equipment log, and interviewed the system engineer and control room operators. Additional documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05Q – 7 samples)

a. Inspection Scope

The inspectors conducted fire protection inspections for several plant fire zones, selected based on the presence of equipment important to safety within their boundaries. The inspectors conducted plant walkdowns and verified the areas were as described in the TMI Fire Hazard Analysis Report, and that fire protection features were properly controlled per surveillance procedure 1038, Administrative Controls-Fire Protection Program, Rev. 74. The plant walkdowns were conducted throughout the inspection period and included assessment of transient combustible material control, fire detection and suppression equipment operability, and compensatory measures established for degraded fire protection equipment in accordance with procedure OP-MA-201-007, Fire Protection System Impairment Control, Rev. 6. In addition, the inspectors verified that applicable clearances between fire doors and floors met the criteria of Attachment 1 of Engineering Technical Evaluation CC-AA-309-101, Engineering Technical Evaluations, Rev. 11. Fire zones and areas inspected included:

- Fire Zone CB-FA-2D, Control Building Elevation 322', East Inverter Room;
- Fire Zone CB-FA-2E, Control Building Elevation 322', West Inverter Room;
- Fire Zone CB-FA-2F, Control Building Elevation 322', East Battery Room;
- Fire Zone CB-FA-2G, Control Building Elevation 322', West Battery Room;
- Fire Zone CB-FA-3D, Control Building Elevation 338'-6", Relay Room;
- Fire Zone DG-FA-1, Diesel Generator Building, Diesel Generator A; and
- Fire Zone DG-FA-2, Diesel Generator Building, Diesel Generator B.

b. Findings

No findings of significance were identified.

1R06 Flood Protection - Underground Electrical Cable Vaults (71111.06 – 1 sample)

a. Inspection Scope

The inspectors accompanied engineers during portions of the semi-annual electrical vault inspection performed in accordance with MA-TM-153-001, Inspection and Maintenance of TMI-1 Electrical and Telephone Manholes, Rev.1. The inspectors selected electrical vaults E5NW, E5SE, E11E, and E11W based on the risk significance of equipment powered by the cables which pass through these vaults.

The inspectors entered the vaults to verify cables and/or splices were intact, support structures provided appropriate support for the cables and cable trays, cables were not submerged in water, dewatering devices functioned properly, and to verify the as-built

configuration matched associated design drawings. The inspectors also verified that degraded conditions (when applicable) were properly identified, documented, corrected, or entered into the corrective action program for resolution.

The inspectors reviewed the documented results of the semi-annual cable vault inspections for 14 additional underground cable vaults performed between March and June 2010. The inspectors discussed the vault inspection results with engineers and maintenance personnel to verify reasonable corrective actions were implemented where appropriate (i.e., repairs to verify installed drainage systems worked, repairs to vault access manways).

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11Q – 1 sample)

a. Inspection Scope

On June 15, the inspectors observed licensed operator requalification (LOR) training at the control room simulator for the 'C' operator crew. The inspectors observed the operators' simulator drill performance and compared it to the criteria listed in TMI Operational Simulator Scenario TQ-LRU-106-S020, Integrated Control System Loop 'A' Reactor Coolant System Flow Failure, Loss of 'D' 4kV Bus, EG-Y-1A Fails to Start, Loss of Coolant Accident with Engineered Safeguards (ES) Components Failing to ES Align, and Failure of the Emergency Response Organization Notification Automated Primary Call Out System, Rev. 00.

The inspectors reviewed the operators' ability to correctly evaluate the simulator training scenario and implement the emergency plan. The inspectors observed supervisory oversight, command and control, communication practices, and crew assignments to ensure they were consistent with normal control room activities. The inspectors observed operator response during the simulator drill transients. The inspectors evaluated training instructor effectiveness in recognizing and correcting individual and operating crew errors. The inspectors attended the post-drill critique in order to evaluate the effectiveness of problem identification. The inspectors verified that emergency plan classification and notification training opportunities were tracked and evaluated for success in accordance with criteria established in Nuclear Energy Institute (NEI) 99-02, Regulatory Assessment Performance Indicator Guideline, Rev. 6. Additional documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12Q – 3 samples)

a. Inspection Scope

The inspectors evaluated the listed samples for Maintenance Rule (MR) implementation by: ensuring appropriate MR scoping; characterization of failed structures, systems, and components (SSCs); MR risk categorization of SSCs; SSC performance criteria or goals;

and appropriateness of corrective actions. Additionally, extent-of-condition follow-up, operability, and functional failure determinations were reviewed to verify they were appropriate. The inspectors verified that the issues were addressed as required by 10 CFR 50.65, Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants; Nuclear Management and Resources Council 93-01, Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, Rev. 2; and Exelon procedure ER-AA-310, Implementation of the Maintenance Rule, Rev. 8. The inspectors verified that appropriate corrective actions were initiated and documented in IRs, and that engineers properly categorized failures as maintenance rule functional failures and maintenance preventable functional failures, when applicable.

- On March 3, operators performed an unplanned shutdown in response to lowering 'B' reactor coolant pump (RC-P-1B) motor upper bearing reservoir oil level (IR 1037870). Further evaluations identified a leaking oil cooler flange due to 2 of 4 closure bolts being loose. Engineers determined the root cause was incorrect bolt torque values. In addition, incorrect fastener hardware type and size in all four bolts was found to be a contributing factor to the oil leak. The inspectors performed field walk downs, interviewed the system engineer, engineering and plant management personnel and maintenance technicians, and reviewed the evaluation of this issue from a maintenance rule perspective. The inspectors verified that Exelon properly identified this failure as a Maintenance Rule Functional Failure and a Maintenance Preventable Functional Failure. The safety significance was minor because the reactor coolant pump motor is not required for safe shutdown, and the lower oil reservoir and associated reactor coolant pump motor lubricating oil piping is not a plant safety system and have no active safety function. The inspectors further monitored RC-P-1B oil levels through this inspection period and verified leakage was stopped;
- On April 8, emergency diesel generator fuel oil storage tank (DF-T-1) plant process computer L2428 alarmed during performance of 'B' emergency diesel generator (EDG) monthly surveillance testing. The local tank level instrument was checked and indicated proper level. Engineering determined operability of the 'B' EDG was not affected since the minimum fuel inventory requirements of TMI technical specification were met (IR 1053925); and
- On June 3, the 'A' EDG (EG-Y-1A) was taken out of service for repair of a damaged scavenging air box gasket that leaked unexpectedly during performance of a monthly surveillance test (IR 1076387). The diesel generator was already out of service for the surveillance test. During the last 45 minutes of the test run, the gasket worked its way further out of its mating surface and the leak worsened. Operators completed the EG-Y-1A surveillance satisfactorily with the degraded gasket and considered the diesel available but inoperable. The inspectors performed field walk downs, interviewed the system engineer, engineering and plant management personnel and maintenance technicians, and reviewed the evaluation and corrective actions of the issue from the maintenance rule perspective. Exelon determined this condition was a leak of combustion air to EG-Y-1A which did not affect any of the diesel system train maintenance rule functions. In addition, the engine successfully carried its required load and completed the monthly surveillance test satisfactorily with the degraded scavenging air box gasket.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed the scheduling, control, and equipment restoration during the following maintenance activities to evaluate their effect on plant risk. This review was against criteria contained in Exelon Administrative Procedure 1082.1, TMI Risk Management Program, Rev. 8 and WC-AA-101, On-Line Work Control Process, Rev. 17A.

- On May 17, technicians performed 1302-1.1, Power Range Calibration, Rev. 56. The 'D' channel of the reactor protection system unexpectedly tripped during this activity, placing the plant in a reduced logic trip condition. Technicians caused the 'D' channel trip, by inadvertently mispositioning the test module switch (IR 1070197). The station blackout diesel generator was also unavailable at this time due to a planned maintenance outage. Station personnel initiated corrective actions including elevated supervisory oversight through completion of 1302-1.1. Online maintenance risk remained Yellow during this activity;
- On June 1, the 'A' makeup pump (MU-P-1A) and 'A' emergency feedwater pump (EF-P-2A) were unavailable due to planned maintenance outages. Online maintenance risk was Yellow during this activity;
- On June 3, the 'A' emergency diesel generator (EG-Y-1A) was taken out of service for repair of a damaged scavenging air box gasket that leaked unexpectedly during performance of monthly surveillance testing (IR 1076387). In addition, divers were performing scheduled cleanup activities of the cooling water intake, screen and pump house. This condition elevated the online maintenance risk profile to Yellow; and
- On June 24, the turbine driven emergency feedwater pump (EF-P-1) was taken out of service for surveillance testing and to repair a broken trip latch reset pin (IR 1083766). This condition elevated the online maintenance risk profile to Yellow.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 – 3 samples)

a. Inspection Scope

The inspectors verified the selected degraded conditions were properly characterized, operability of the affected systems was properly evaluated in relation to Technical Specification (TS) requirements, applicable extent-of-condition reviews were performed, and no unrecognized increase in plant risk resulted from the equipment issues. The inspectors referenced NRC Inspection Manual Chapter Part 9900, Operability

Determinations & Functionality Assessments for Resolutions of Degraded or Nonconforming Conditions Adverse to Quality or Safety and Exelon procedure OP-AA-108-115, Operability Determinations, Rev. 9, to determine acceptability of the operability evaluations. The inspectors reviewed operability evaluations for the following degraded equipment issues:

- On May 15, operators identified that check valve (NS-V-205, make up to nuclear service [NS] surge tank check valve) failed to close (leaked-by) during required in-service test per procedure OP-TM-541-207, IST of NS-V-205, Rev. 1 (IR 1069675). The function of this valve is to isolate the seismic NS system from the non-seismic demineralized water (DW) system during a postulated seismic event that results in rupture of the non-seismic DW system pipe. Engineers determined this condition did not impact operability of the NS system and authorized closure of the upstream manual isolation valve NS-V102 to isolate the failed check valve pending repairs. The check valve was repaired on June 2 per Work Order C-2023643 and retested satisfactorily.
- On May 26, operators identified that steam generator (SG) level indicator FW-LT-1046 deviated significantly from the other three SG level indication channels (IR 1073781). Operators promptly reselected FW-LT-1047 to control emergency feedwater injection valve (EF-V-30A) and to provide indication to SG level recorder FW-LR-1083. Operators also bypassed the FW-LT-1046 input to the heat sink protection system (HSPS) and the integrated control system. HSPS remained operable because the required number of SG level channels remained available.
- On June 23, operators could not properly reset the turbine driven emergency feedwater pump (EF-P-1) governor trip lever (IR 1083766) during performance of surveillance test OP-TM-424-203, section 4.7 which requires manual trip and reset of the governor and trip lever mechanism. Further investigation identified a failed trip lever reset pin. On June 25, after the failed reset pin was replaced, EF-P-1 tripped unexpectedly during the post maintenance test run (IR 1084238). Engineers determined this trip was due to improper resetting of the trip mechanisms and implemented required operator training and procedure revisions to prevent reoccurrence. The inspectors reviewed the circumstances associated with these two issues, and interviewed the system engineer and operators to ensure operability was properly supported.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (PMT) (71111.19 – 7 samples)

a. Inspection Scope

The inspectors reviewed and/or observed the following PMT activities to ensure: (1) the PMT was appropriate for the scope of the maintenance work completed; (2) the acceptance criteria were clear and demonstrated operability of the component; and (3) the PMT was performed in accordance with procedures.

- On April 16, operators performed procedure OP-TM-541-201, IST of NSRW Pumps and Valves, Rev. 6 following corrective maintenance to repair a damaged pump (NR-P-1A) strainer upper bearing (IR 1055228);
- On May 25, operators and technicians performed procedure 1303-4.19, HPI/LPI Analog Channel Test, Rev. 30, after channel 2 relay replacement per Work Order C2023494 to address unexpected engineered safeguards actuation system contact replacement;
- On May 27, operators and technicians performed operational test procedure 1107-9, SBO Diesel Generator, Rev. 62, following a planned overhaul of the station blackout (SBO) diesel generator EG-Y-4;
- On May 30, operators and engineers performed post maintenance testing of the 'B' RCP following corrective maintenance to repair a leaking weld in the upper motor bearing oil cooler piping per Work Order C-2023176-02 (IR 1075511);
- On June 1, operators performed procedure OP-TM-424-201, IST of EF-P-2A, Rev. 6, following corrective maintenance to replace pressure gages EF-PI-1282 and EF-PI-1761A;
- On June 3, operators performed procedure 1303-4.16, Emergency Power System, Rev. 122, following corrective maintenance to repair a gasket leak in EG-Y-1A (IR 1076387); and
- On June 25, operators performed procedure OP-TM-424-203, IST of EF-P-1 and Valves, Rev. 6, following corrective maintenance to address an unexpected pump trip during a post maintenance test run following replacement of a failed trip latch reset pin (IR 1084238).

b. Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activities (71111.20 – 1 sample)

Planned Maintenance Outage to Repair Reactor Coolant Pump (RC-P-1B) Oil Leak and 'A' Cooling Tower Distribution Header Leak

a. Inspection Scope

On May 28, operators performed a planned shutdown in response to lowering 'B' RCP upper bearing lubricating oil level (IR 1037870) and flow degradation on the 'A' cooling tower (CW-C-1A, IR 1073479). Operators returned the plant to full power on May 31, following repair of a leaking weld on the 'B' RCP upper oil reservoir cooler outlet (RC-C-1B, IR 1075511) and repair of a severed 36 inch man-way in the 'A' cooling tower main return header. The inspectors reviewed shutdown and startup activities to determine whether reactivity control and shutdown safety functions were properly maintained. Specific attributes evaluated included configuration management, communications, instrumentation accuracy, and identification and resolution of problems. The inspectors

also performed inspections of accessible areas inside containment, interviewed applicable engineers, supervisors, and plant operators, and consulted with NRC specialists. Additional documents reviewed during the inspection are listed in the Attachment. Specific maintenance activities performed by the licensee during this shutdown and reviewed by the inspectors included:

- RCP-P-1B upper bearing lubricating oil level, lowering trend;
- RCP-P-1C lower oil reservoir level, lowering trend;
- Inspection of several temporary modifications previously installed (March 3, 2010) to permit remote draining of the RCP oil leak collection tanks and troubleshooting of the 'B' and 'C' RCPs;
- Inspection of the incore instrumentation seal table;
- Inspection of the 'A' cooling tower; and
- Plant power ascension.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 – 3 samples)

a. Inspection Scope (2 Inservice Testing [IST] Sample and 1 Routine Surveillance Samples)

The inspectors observed and/or reviewed the following operational surveillance tests to verify adequacy of the test to demonstrate the operability of the required system or component safety function. Inspection activities included review of previous surveillance history to identify problems and trends, observation of pre-evolution briefings, and initiation/resolution of related IRs for selected surveillances.

- On May 14, OP-TM-211-206, IST of MU-P-1B, Rev. 5;
- On May 21, OP-TM-220-251, RCS Leak Rate Determination, Rev. 9 and Interim Change IC-28815. In addition, the inspectors reviewed IRs 1072085, 1072086, 1072197, 1072211 and 1072376, and the associated Complex Troubleshooting Plan; and
- On June 23, OP-TM-424-203, IST of EF-P-1 and Valves, Rev. 6.

b. Findings

No findings of significance were identified.

**Emergency Preparedness (EP)**

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

a. Inspection Scope

An onsite review was conducted to assess the maintenance and testing of the TMI ANS. During the inspection, the inspectors interviewed the EP staff responsible for overseeing the ANS testing and maintenance of the system. The inspectors reviewed ANS system

maintenance and test records, ANS procedures, and the ANS design report to ensure Exelon's compliance with design report commitments for system maintenance and testing. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 2. Planning Standard 10 CFR 50.47(b)(5) and the related requirements of 10 CFR 50, Appendix E, were used as reference criteria.

b. Findings

No findings of significance were identified.

1EP3 Emergency Response Organization (ERO) Staffing and Augmentation System (71114.03 - 1 sample)

a. Inspection Scope

The inspectors conducted a review of TMI's ERO augmentation staffing requirements and the process for notifying and augmenting the ERO. This was performed to ensure the readiness of key licensee staff to respond to an emergency event and to ensure Exelon's ability to activate their emergency facilities in a timely manner. The inspectors reviewed the TMI ERO roster, a sample of training records, augmentation drill reports, applicable procedures, and IRs related to the ERO staffing augmentation system. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 3. Planning Standard 10 CFR 50.47(b)(2) and related requirements of 10 CFR 50, Appendix E, were used as reference criteria.

b. Findings

No findings of significance were identified.

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04 - 1 sample)

a. Inspection Scope

Since the last NRC inspection of this program area, Exelon implemented various changes to their Emergency Plan and Implementing Procedures. Exelon had determined that, in accordance with 10 CFR 50.54(q), any change made to the Plan, and its lower-tier implementing procedures, had not resulted in any decrease in effectiveness of the Plan, and that the revised Plan continued to meet the standards in 50.47(b) and the requirements of 10 CFR 50 Appendix E. The inspectors reviewed all Emergency Plan changes, including the changes to lower-tier emergency plan implementing procedures, to evaluate for any potential decreases in effectiveness of the Emergency Plan. However, this review by the inspectors was not documented in an NRC Safety Evaluation Report and does not constitute formal NRC approval of the changes. Therefore, these changes remain subject to future NRC inspection in their entirety. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 4. The requirements in 10 CFR 50.54(q) were used as reference criteria.

b. Findings

No findings of significance were identified.



## 1EP5 Correction of Emergency Preparedness Weaknesses (71114.05 - 1 sample)

a. Inspection Scope

The inspectors reviewed a sample of self-assessment reports and the Corrective Action Program (CAP) procedure to assess Exelon's ability to evaluate their EP performance and program. The inspectors reviewed a sample of drill reports, focused area self-assessments reports, 10 CFR 50.54(t) audits, and IRs initiated by Exelon at TMI from drills and audits. This inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 5. Planning Standard 10 CFR 50.47(b)(14) and the related requirements of 10 CFR 50, Appendix E, were used as reference criteria.

b. Findings

No findings of significance were identified.

## 1EP6 Drill Evaluation (71114.06 - 1 sample)

a. Inspection Scope

The inspectors observed an emergency event training evolution conducted on June 22, at the Unit 1 control room simulator and the technical support center to evaluate emergency procedure implementation, event classification, and event notification. The 'D' operating crew response to TMI Operational Simulator Scenario TQ-LRU-106-S020 was assessed. The event scenario involved multiple safety-related component failures and plant conditions warranting a simulated Alert event declaration. The inspectors observed the drill critique to determine whether the licensee critically evaluated drill performance to identify deficiencies and weaknesses. Additionally, the inspectors verified the drill/exercise performance indicators were properly evaluated consistent with NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Rev. 6.

b. Findings

No findings of significance were identified.

**2. RADIATION SAFETY****Cornerstone: Occupational Radiation Safety (OS)**

## RS01 Access Control to Radiologically Significant Areas (71124.01)

a. Inspection Scope

The inspectors reviewed selected activities and associated documentation in the below listed areas. The evaluation of Exelon's performance was against criteria contained in 10 CFR 20, applicable Technical Specifications, and applicable station procedures.

Inspection Planning

The inspectors reviewed Performance Indicators (PIs) for the Occupational Exposure Cornerstone. The inspectors also reviewed the results of recent radiation protection

program audits and assessments and any reports of operational occurrences related to occupational radiation safety since the last inspection.

#### Radiological Hazard Assessment

The inspectors held discussions with plant operations personnel to identify any significant new radiological hazard for onsite workers or members of the public. The inspectors assessed the potential impact of the changes and the periodic monitoring to detect and quantify the radiological hazard.

The inspectors reviewed radiological surveys from five selected plant areas (Fuel Handling and Auxiliary Buildings, Resin Transfer areas, Spent Fuel Pool area, Reactor Building) to verify that the thoroughness and frequency of the surveys were appropriate for the given radiological hazard.

The inspectors conducted walk-downs of the facility, including radioactive waste processing, storage, and handling areas to evaluate material conditions and potential radiological conditions. The inspectors also toured the steam generator storage facility. The inspectors made independent radiation measurements to verify conditions.

The inspectors selected three radiological risk-significant work activities (RWPs 1-10-6, 12, and 14/15, associated with make-up filter and Reactor Building work) that involved exposure to radiation to verify that appropriate pre-work surveys were performed to identify and quantify the radiological hazard and to establish adequate protective measures. The evaluation included identification of hot particles, the presence of alpha emitters, the potential for airborne radioactive materials, potential changes in radiological conditions, and non-uniform exposures of the body.

The inspectors selectively reviewed air sample survey records associated with Reactor Building work to verify that samples were collected and counted in accordance with procedures.

#### Instructions to Workers

The inspectors reviewed three radiation work permits (RWPs) used to access high radiation areas to identify work control instructions or control barriers specified, use of stay times or permissible dose, and appropriate electronic personal dosimeter alarm set-points were in conformance with survey indications.

#### b. Findings

No findings of significance were identified.

#### **Cornerstone: Public Radiation Safety (PS)**

RS06 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

#### a. Inspection Scope

##### Inspection Planning and In-office Inspection

The inspectors performed in-office preparation before the inspection to review available documentation (e.g., annual reports submitted).

#### Event Report and Effluent Report Reviews

The inspectors reviewed the 2008 and 2009 Annual Radiological Effluent Release Reports issued since the last inspection. The inspectors determined if the reports were submitted as required by the Offsite Dose Calculation Manual (ODCM)/Technical Specifications. The inspectors reviewed the reports for anomalous results, and for unexpected trends or abnormal releases identified by the licensee for further inspection to determine if they were evaluated, entered in the corrective action program, and adequately resolved.

The inspectors reviewed the Radiological Effluent Release reports to identify radioactive effluent monitor operability issues reported by the licensee as provided in effluent release reports. The inspectors reviewed these issues during the onsite inspection, as warranted, given their relative significance. The inspectors determined if the issues were entered into the corrective action program and adequately resolved.

#### ODCM and Final Safety Analysis Report Reviews

The inspectors reviewed the UFSAR descriptions of the radioactive effluent monitoring systems, treatment systems, and effluent flow paths.

The inspectors reviewed, as available, changes to the ODCM made by the licensee since the last inspection. The inspectors reviewed the changes against the guidance in NUREG-1301, 1302 and 0133, and Regulatory Guides 1.109, 1.21 and 4.1 to identify differences, review the technical basis or evaluations of the change during the inspection, and to determine whether they were technically justified and maintained effluent releases as low as reasonably allowable.

#### Groundwater Protection Initiative (GPI) Program

The inspectors reviewed reported groundwater monitoring results, and changes to the program for identifying and controlling contaminated spills/leaks to groundwater. (Note: During this inspection, the inspectors conducted an inspection relative to NRC TI-2515/173, Review of the Implementation of the Industry Ground Water Protection Voluntary Initiative. See Section 4OA5.)

#### Procedures, Special Reports & Other Documents

The inspectors reviewed licensee event reports, event reports and/or special reports related to the effluent program issued since the previous inspection. The inspectors reviewed these documents to identify any additional focus areas for the inspection based on the scope/breadth of problems described in these reports.

#### Walkdowns and Observations

The inspectors determined whether the licensee made any significant changes to its effluent release points, e.g., changes subject to a 10 CFR 50.59 review or requiring NRC approval of alternate discharge points.

### Sampling and Analyses.

The inspectors selectively reviewed the intra and inter-laboratory comparison program to verify the quality of the radioactive effluent sample analyses.

### Dose Calculations.

The inspectors evaluated any significant changes in reported dose values compared to the previous period including factors which may have resulted in the change.

The inspectors selectively reviewed three liquid discharge permits (L2009-03004, L2009-09050, and L2009-02507) to verify dose to members of the public.

The inspectors discussed changes in the station offsite dose calculations since the last inspection. The inspectors selectively verified the changes, as available, were consistent with the ODCM and Regulatory Guide 1.109. The inspectors selectively reviewed meteorological dispersion and deposition factors used in the ODCM and effluent dose calculations to ensure appropriate factors were being used for public dose calculations.

### GPI Implementation

The inspectors selectively reviewed implementation of the ground water monitoring program. (Note: During this inspection, the inspectors conducted an inspection relative to NRC Temporary Instruction TI-2515/173, Review of the Implementation of the Industry Ground Water Protection Voluntary Initiative. See Section 4OA5).

The inspectors reviewed monitoring results of the GPI to determine if the licensee has implemented its program as intended and to identify any anomalous or missed results. For anomalous results or missed samples, the inspectors verified the licensee identified and addressed deficiencies through its corrective action program.

The inspectors selectively reviewed identified leakage or spill events and selectively reviewed 10 CFR 50.75(g) records and evaluations including the source of the leak or spill and mitigation.

The inspectors reviewed the evaluation of discharges from onsite surface water bodies (e.g., ponds, retention basins, lakes) that contain or potentially contain radioactivity, and if the licensee was accounting for discharges from these surface water bodies as part of the effluent release report.

The inspectors verified that on-site ground water sample results and a description of any significant on-site leaks/spills into ground water for each calendar year are documented in the Annual Radiological Environmental Operating Report for the Radiological Environmental Monitoring Program (REMP) or the Annual Radiological Effluent Release Report for the radiological effluent technical specifications.

The inspectors discussed any new, significant effluent discharge points to determine if the ODCM was updated to include the new release point, as applicable.

Problem Identification and Resolution.

The inspectors verified that problems associated with the effluent monitoring and control program were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the corrective action program.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES**

4OA1 Performance Indicator Verification (71151)

a. Inspection Scope

.1 Cornerstone: Barrier Integrity (1 samples)

The inspectors reviewed selected station records, corrective action program documents, calculation methods, and definitions of terms to verify NRC performance indicators (PIs) had been accurately reported to the NRC as required by NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Rev. 5 and 6. The PI sample listed below was verified for the period October 2009 to June 2010.

- Reactor Coolant System Identified Leak Rate

.2 EP Performance Indicators (3 samples)

a. Inspection Scope

The inspectors reviewed data for the TMI EP PIs, which are: (1) Drill and Exercise Performance; (2) ERO Drill Participation; and, (3) ANS Reliability. The inspectors reviewed the PI data and its supporting documentation for 2009 to verify the accuracy of the reported data. The review of these PIs was conducted in accordance with NRC Inspection Procedure 71151, using the acceptance criteria documented in NEI 99-02, Regulatory Assessment Performance Indicator Guidelines.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Review of Issue Reports and Cross-References to Problem Identification and Resolution Issues Reviewed Elsewhere

a. Inspection Scope

The inspectors performed a daily screening of items entered into the licensee's corrective action program. This review was accomplished by reviewing a list of daily IRs,

reviewing selected IRs, attending daily screening meetings, and accessing the licensee's computerized corrective action program database.

.2 Identification and Resolution of Problems Related to Health Physics

a. Inspection Scope (71124.01, 71124.06)

The inspectors selectively reviewed audits and assessments of the occupational radiation safety program and effluent monitoring program. The inspectors also reviewed selected corrective action documents written since the previous inspection. Additional documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

.3 Semi-Annual Review to Identify Trends (1 sample)

a. Inspection Scope

The inspectors performed a semi-annual review of common cause issues in order to identify any unusual trends that might indicate the existence of a more significant safety issue. This review included an evaluation of repetitive issues identified via the corrective action program, self-revealing issues, and issues evaluated using programs supplemental to the formal corrective action program, such as the maintenance rule program and corrective maintenance program. The results of the trending review were compared with the results of normal baseline inspections.

b. No findings of significance were identified. The inspectors noted a trend of configuration control deficiencies. Although each issue had only minor or very low safety significance, the trend was notable. TMI personnel identified this same trend and implemented several corrective actions to focus station attention to improve human performance in the area of configuration control. The inspectors observed that configuration control improved in the month of June, indicating that corrective actions were having a positive effect.

.4 Annual Sample: Review of the Operator Work-around Program

a. Inspection Scope (1 sample)

The inspectors reviewed the cumulative effects of the existing operator work-arounds (OWAs), the list of operator challenges, existing operator aids and disabled alarms, the list of operations department concerns, and the list of open main control room deficiencies and main control room tags to identify any effect on emergency operating procedure operator actions, and impact on possible initiating events and mitigating systems. The inspectors also interviewed selected operations and engineering personnel to assess their understanding of the OWAs and other listed disabled alarms and control room deficiencies. The inspectors evaluated whether station personnel were identifying, assessing, and reviewing OWAs as specified in Exelon administrative procedure OP-AA-102-103, Operator Work-Around Program, Rev. 2. Additional documents reviewed are listed in the Attachment.

b. Findings and Observations

No findings of significance were identified.

.5 Annual Sample: Assessment of Corrective Actions Associated with River Water Pump Elevated Vibration Levels

a. Inspection Scope

This inspection was conducted to assess whether Exelon's corrective actions associated with the elevated vibration of various river water pumps were reasonable to correct the identified causes and prevent recurrence of the problem. Specifically, since 2006, numerous IRs were generated in response to elevated vibration levels associated with the reactor building emergency cooling, decay heat, nuclear service and secondary service river water pumps. The inspectors interviewed plant personnel, and reviewed performance data, operating and surveillance test procedures, and test results to evaluate the performance of the river water pumps and the effectiveness of Exelon's corrective actions. In addition, the inspectors observed technicians in the field collect weekly vibration data associated with several river water pumps to assess the collection process and material condition of the pumps. The inspectors reviewed system health reports and IRs associated with the river water pumps to evaluate past performance of the system and determine if Exelon had corrected deficient conditions when identified. The inspectors reviewed Exelon's vibration program basis document to ensure Exelon was following internal guidance for the evaluation of the vibration data. Additional documents reviewed are listed in the Attachment.

b. Findings and Observations

No findings of significance were identified. The inspectors determined that Exelon's corrective actions associated with the elevated vibration levels of the river water pumps were reasonable to address the issue and prevent recurrence. The inspectors confirmed that Exelon was adequately monitoring and trending relevant pump parameters so that degrading conditions could be identified and addressed in a timely fashion. In addition, the inspectors confirmed that Exelon met the vibration monitoring requirements of American Society of Mechanical Engineers Code for Operation and Maintenance of Nuclear Power Plants, Subsection ISTB, In-Service Testing of Pumps. The inspectors concluded that the corrective actions were appropriate, which included upgrading pump shaft and coatings, as well as implementing more restrictive machining tolerances of the pump shaft ends. Also, the corrective actions included addition of pump column readings on a weekly frequency to the vibration program to assist in evaluating overall pump performance. The inspectors did not identify any river water pump performance issues associated with elevated vibration levels since the licensee incorporated corrective actions.

4OA5 Other

.1 (Closed) Temporary Instruction 2515/173, Review of the Implementation of the Industry Groundwater Protection Voluntary Initiative

a. Inspection Scope

An NRC assessment was performed of Exelon Three Mile Island's Ground Water Protection Program to determine whether Exelon implemented the voluntary Industry Groundwater Protection Initiative, dated August 2007 (Nuclear Energy Institute 07-07, ADAMS Accession Numbers ML072610036 and ML072600292). Inspectors interviewed personnel, performed walk-downs of selected areas as needed, and reviewed the following items:

- Records of the site characterization of geology and hydrology;
- Evaluations of systems, structures, and or components that contain or could contain licensed material and evaluations of work practices that involved licensed material for which there is a credible mechanism for the licensed material to reach the groundwater;
- Implementation of an onsite groundwater monitoring program to monitor for potential radioactive material leakage into groundwater;
- Procedures for the decision making process for potential remediation of leaks and spills, including consideration of the long term decommissioning impacts;
- Records of leaks and spills recorded, if any, in Exelon's decommissioning files in accordance with 10 CFR 50.75(g);
- Exelon briefings of local and state officials on Exelon's groundwater protection initiative;
- Protocols for notification to the local and state officials, and to the NRC regarding detection of leaks and spills;
- Protocols and/or procedures for thirty-day reports if an onsite groundwater sample exceeds the criteria in the radiological environmental monitoring program;
- Groundwater monitoring results as reported in the annual effluent and/or environmental monitoring report; and
- Exelon and industry assessments of implementation of the groundwater protection initiative.

c. Findings

No findings of significance were identified. Implementation of the Industry Groundwater Protection Initiative is voluntary. Under the final Initiative, each site was to have developed an effective, technically sound ground water protection program by August 2008.

The inspectors determined that, at the time of this inspection, Exelon had not taken action on all ground water initiative objectives (as outlined in the Temporary Instruction) as follows:



- GPI Objective 1.2 g - At the time of this inspection, a specific frequency had been established for periodic reviews of structures, systems, and components and work practices. However, the frequency had not yet been placed in a procedure. This matter was identified in a self-assessment and placed in the corrective action program (IR 924237)
- GPI Objective 1.3 f - At the time of the inspection, Exelon did not have a defined program established for the preventative maintenance of ground water wells. Exelon identified this issue during an assessment of GPI implementation and placed this issue into its corrective action program. (IR 924237)
- GPI Objective 1.4 a.- At the time of this inspection, written procedures had not been established outlining the decision making process for remediation of leaks or spills or other instances of inadvertent releases, including consideration of migration pathways. Exelon identified this issue during an assessment of GPI implementation and placed this issue into its corrective action program. (IR 924237)
- GPI Objective 1.4 c.- At the time of this inspection, an evaluation had not been performed and documented on the decommissioning impacts resulting from remediation activities or the absence thereof (e.g., do licensee procedures include a decision making process to evaluate prompt remediation or delayed remediation and its impact on decommissioning). Exelon identified this issue during an assessment of GPI implementation and placed this issue into its corrective action program. (IR 924237)
- GPI Objective 1.5 - Exelon developed program procedures to establish a record keeping program to meet the requirements of 10 CFR 50.75(g) and developed an historical spill/leak list. However, Exelon identified during a June 2010 audit, that the individual record files did not reflect some information contained in station files. Exelon initiated a review to ensure all appropriate information, consistent with criteria in 10 CFR 50.75(g) and the program procedure, were included in its decommissioning files. Exelon placed this matter into its corrective action program. (IR 1081998)
- GPI Objective 3.2 a. - An independent, knowledgeable individual had not performed, under the auspices of NEI, an initial review within one year of the initial self-assessment, per GPI Objective 3.1.a. This assessment was completed on February 28, 2010. Exelon placed this matter into its corrective action program. (IR 1041430).

## .2 Administrative Correction to Inspection Record

Inspection Report 05000289/2010007 summary of findings inadvertently documented an incorrect cross-cutting aspect number for finding NCV 05000289/2010007-02, Deficient Design Change Implementation and Controls Resulted in Unfiltered Radioactivity Release to the Environment. The correct Human Performance Resources cross-cutting aspect was H.2(c), as documented in section 4OA3.3.6 of that inspection report.

## 4OA6 Meetings, Including Exit

### Exit Meeting Summary

Enclosure

On July 21, 2010, the resident inspectors presented the inspection results to Mr. William Noll and other members of the TMI staff who acknowledged the findings. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

#### 40A7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy for being dispositional as NCVs.

- 10 CFR 50.54(q) states that the licensee shall follow and maintain in effect emergency plans which meet the standards in 10 CFR 50.47(b) and the requirements in appendix E of this part. The TMI Emergency Plan indicates that the plant paging system provides immediate warning and instructions to onsite personnel in an event of an emergency. In March 2010, Exelon began testing their on-site speakers in response to an IR and industry operating experience. A total of 301 out of 405 on site speakers were tested. Of the 301 tested, 108 speakers had identified deficiencies. Contrary to the TMI Emergency plan, the 108 speakers would not provide immediate warning and instruction to onsite personnel during an emergency. This issue was identified in Exelon's CAP as IRs 922582 and 1035621. Upon discovery, Exelon issued a standing order to issue blow horns to Operations and Security staff to notify people in areas that would need to be evacuated during an emergency. The finding is of very low safety significance because prompt compensatory measures were taken upon discovery.

ATTACHMENT: SUPPLEMENTAL INFORMATION

**SUPPLEMENTAL INFORMATION  
KEY POINTS OF CONTACT**

Licensee Personnel

D. Atherhoff	Manager, Regulatory Assurance
C. Baker	Manager, Chemistry
J. Bashista	System Engineer
K. Boring	NSSS Branch Manager
G. Chevalier	Chemist
D. DeBoer	Director, Operations
D. Divittore	Manager, Radiological Engineering
D. Etheridge	Manager, Radiation Protection Technical Support
R. Green	Program Engineer, Buried Pipe
C. Incorvati	Director, Maintenance
J. Karkoska	Manager, Site Security
W. Knoll	Site Vice President
M. Krause	Component Monitoring Engineer
R. Libra	Plant Manager
D. Neff	Manager, Emergency Preparedness
J. Newmann	Emergency Preparedness Coordinator
W. Noll	Site Vice President
T. Orth	System Engineer Supervisor
J. Piazza	Senior Manager, Engineering
T. Roberts	Supervisor, Radiation Protection
K. Robles	System Engineer
R. Rogers	EP Siren Coordinator
J. Schork	Lead LORT Instructor
L. Weber	Chemist
L. Weir	Manager, Nuclear Oversight Services
C. Wend	Manager, Radiation Protection

Other

D. Dyckman	Nuclear Safety Specialist Pennsylvania Department of Environmental Protection Bureau of Radiation Protection
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**LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

Closed

None

Opened and Closed

NRC TI-2515/173	Review of the Implementation of the Industry Ground Water Protection Voluntary Initiative (Section 4OA5)
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## LIST OF DOCUMENTS REVIEWED

### **Section 1R01: Adverse Weather**

#### Other

Insulating Fluid Analysis for TMI-1 'A' Auxiliary Transformer, Dated 6/3/2010  
TMI-1 UFSAR Section 2.6.4 Flood Studies  
TMI-1 UFSAR Section 2.6.5 Design of Hydraulic Facilities  
TMI-1 Technical Specification 3.14.1.1

### **Section 1R04: Equipment Alignment**

#### Procedures

OP-TM-211-000, Makeup and Purification System, Rev. 019A, Interim Change 28596  
OP-TM-541-000, Primary Component Cooling, Rev. 12  
1303-4.16, Emergency Power System, Rev. 122

#### Drawings

302-202, Nuclear Services River Water System, Rev. 77  
302-660, Makeup and Purification System, Rev. 44  
302-661, Makeup and Purification System, Rev. 59  
302-082, Emergency Feedwater System, Rev. 24

### **Section 1R05: Fire Protection**

#### Drawings

E-216-021, TMI Electrical Manholes & Underground Ducts Turbine Building to Circulating Water Pump House Area, Rev. 10  
E-216-022, TMI Electrical Manholes & Underground Ducts Auxiliary Building to Screen House Area, Rev. 17

#### Other

IRs 1043638, 1044859, 1046016, 1080570

### **Section 1R11: Licensed Operator Regualification Program**

#### Procedures

EP-AA-112-100-F-01, Shift Emergency Director Checklist, Rev. K  
EP-AA-1009, Radiological Emergency Plan Annex for the Three Mile Island (TMI) Station, Rev. 15  
OP-TM-AOP-013, Loss of 1D 4160 Volt Bus, Rev. 5  
OP-TM-AOP-050, Reactor Coolant Leakage, Rev. 1  
OP-TM-AOP-070, Primary to Secondary Heat Transfer Upset, Rev. 2  
OP-TM-EOP-001, Reactor Trip, Rev. 10  
OP-TM-EOP-006, Loss of Coolant Accident Cooldown, Rev. 7  
OP-TM-EOP-010, Emergency Procedure Rules, Guides, and Graphs, Rev. 11  
OP-TM-864-901, Station Blackout Diesel Generator (EG-Y-4) Operations, Rev. 009

### **Section 1R20: Refueling and Other Outage Activities**

#### Procedures

1102-2, Plant Startup, Rev. 150  
1102-4, Power Operation, Rev. 118  
1102-10, Plant Shutdown, Rev. 96

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

Procedures

EP-AA-100, Exelon Nuclear Standardized Radiological Emergency Plan, Rev. 20  
EP-AA-1009, Exelon Nuclear Radiological Emergency Plan Annex for Three Mile Island (TMI) Station, Rev. 15  
EP-MA-121-1002, Exelon East Alert Notification System (ANS) Program, Rev. 6  
EP-MA-121-1006, Exelon East ANS Siren Monitoring, Troubleshooting, and Testing, Rev. 6

Other

Three Mile Island Nuclear Power Plant – Upgraded Public Alert Notification System (ANS) Report March 2005

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

Procedures

EP-AA-100, Exelon Nuclear Standardized Radiological Emergency Plan, Rev. 20  
EP-AA-112-100-F-01, Shift Emergency Director Checklist, Rev. K  
EP-AA-112-100-F-07, Mid-Atlantic ERO Notification or Augmentation, Rev. E  
EP-AA-1009, Exelon Nuclear Radiological Emergency Plan Annex for Three Mile Island (TMI) Station, Rev. 15  
OP-TM-112-101-1002-F-1, Shift Staffing Turnover Checklist, 3/31/2010, Rev. 0  
TQ-AA-113, ERO Training and Qualification, Rev. 17

Other

ERO Roster for 4/5 – 4/12 2010  
TMI February 09, 2010 Drill Evaluation Report  
TMI February 19, 2009 Drill Evaluation Report  
TMI September 22, 2009 Drill Evaluation Report  
Biennial Exercise Evaluation Report April 14, 2009  
ERO Augmentation Drill (Pager Test) Memo 6/27/2009 Call-in Augmentation Drill Results  
ERO Augmentation Drill (Pager Test) Memo 7/30/2009 Call-in Augmentation Drill Results  
ERO Augmentation Drill (Call-in/Drive-in) Memo 9/10/2009 Augmentation Drill (Call-in/Drive-in) Results  
10/21/2009 Call-in Augmentation Drill Results  
TMI 8/26/2009 Medical Drill Evaluation Report

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

Procedures

EP-AA-120, Emergency Plan Administration, Rev. 12  
EP-AA-120-1001, 10 CFR 50.54(q) Change Evaluation, Rev. 5  
EP-AA-121, Emergency Response Facilities and Equipment Readiness, Rev.9

Other

10 CFR 50.54(q) packages:  
09-87, Exelon Nuclear Standardized Radiological Emergency Plan, Rev. 20  
09-97, Radiological Emergency Plan Annex for Three Mile Island Station (TMI), Rev. 14  
10-19, EP-AA-1104 Drill/Exercise Emergency Response Organization (ERO) Team Participation and Preparedness Expectations, Rev. 0  
09-80, EP-AA-112, Emergency Response Organization (ERO)/Emergency Response Facilities (ERF) Activation and Operation, Rev. 14  
09-74, EP-AA-114, Notifications, Rev. 9

09-99, EP-AA-1200, Emergency Plan Administration, Rev. 11  
09-86, EP-AA-121, Emergency Response Facilities and Equipment Readiness, Rev. 8  
09-09, EP-MA-121-1002, ANS Program, Rev. 6

**Section 1EP5: Correction of Emergency Preparedness Weaknesses**

Procedures

LS-AA-125, Corrective Action Program (CAP) Procedure, Rev. 14

Other

EP NOS Audit Preparedness 851500 Assignment 3  
TMI Station 2010 NRC Baseline Program Inspection Readiness Assessment 995622-03  
TMI NRC Exercise Inspection Readiness Assessment 844151-02  
Emergency Preparedness Audit, NOSA-TMI-08-03, Three Mile Island AR# 751084  
EP Audit NOSA-TMI-08-03, Three Mile Island, AR# 751084, April 14 to April 18, 2008  
EP Audit NOSA-TMI-09-04 (AR 896460), Three Mile Island, April 27, 2009 to May 1, 2009  
IRs: 00876285, 00876289, 00884106, 00886126, 00907555, 00907564, 00914382, 00941310,  
00950481

**Section 1EP6: Drill Evaluation**

Procedures

EP-AA-112-100-F-01, Shift Emergency Director Checklist, Rev. K  
EP-AA-1009, Radiological Emergency Plan Annex for the Three Mile Island (TMI) Station,  
Rev. 15  
OP-TM-AOP-013, Loss of 1D 4160 Volt Bus, Rev. 5  
OP-TM-AOP-050, Reactor Coolant Leakage, Rev. 1  
OP-TM-AOP-070, Primary to Secondary Heat Transfer Upset, Rev. 2  
OP-TM-EOP-001, Reactor Trip, Rev. 10  
OP-TM-EOP-006, Loss of Coolant Accident Cooldown, Rev. 7  
OP-TM-EOP-010, Emergency Procedure Rules, Guides, and Graphs, Rev. 11  
OP-TM-864-901, Station Blackout Diesel Generator (EG-Y-4) Operations, Rev. 009

**Section 2RS01 and 2RS06: Access Control to Radiologically Significant Areas and Radioactive Gaseous and Liquid Effluent Treatment**

Procedures

CY-AA-170-1100, Quality Assurance for Radiological Monitoring, Rev. 4  
EN-AA-407, Response to Unplanned Discharge of Licensed radionuclide to Ground Water,  
Surface Water or Soil, Rev. 2  
RP-AA-220, Bioassay Program, Rev. 6  
RP-AA-228, 10 CFR 50.75(g) and 10 CFR 72.30 (D) Documentation Requirements, Rev. 0  
RP-AA-300, Radiological Survey Program, Rev. 6  
RP-AA-300-1001, Discrete radioactive Particle Control, Rev. 1  
RP-AA-300-1002, Rev.1, Electron Isotope Control, Rev. 1  
RP-AA-301, Radiological Air Sampling Program  
RP-AA-460, Control for High and Locked High Radiation Area, Rev. 19  
RP-AA-460-001, Control for Very High Radiation Areas, Rev. 2  
RP-AA-460-002, Additional High Radiation Exposure Control, Rev. 0  
RP-AA-463-1001, Failed Fuel Surveillance Guidance, Rev. 0  
RP-TM-301-1001, TMI Air Sampling Program, Rev. 1  
RP-TM-460-1003, Access to Reactor In-core Under-vessel Area, Rev. 1  
N1828, Quality Assurance program for Effluent Monitoring, Rev. 10

Incident Reports

855219, 855243, 85523, 903640, 924237, 996823, 984492, 988600, 1007668, 1032812, 1041403, 1068950, 1069102, 1081489, 1081631, 1081653, 1081747, 1081924, 1081998, 1081999, 1082043

Other

Annual Radiological Environmental, Effluent Release Reports- 2008, 2009  
Audit No. 05-A-09  
Audit 09-06 (IR 939772)  
Cross-Functional Assessment- Radiation Monitors, Effluent, and Ground water, March 2010  
Intra and Inter Laboratory Cross-check Analysis Results  
Intra-Inter Laboratory Quality Assurance Program  
NEI-07-07 Peer Assessment  
Offsite Dose Calculation Manual and changes  
Three Mile Island News Releases  
10 CFR 50.75(g)- History file record summary/additions

**Section 40A1: Performance Indicator (PI) Verification**

Procedures

LS-AA-2001, Collecting and Reporting NRC Performance Indicator Data, Rev. 13  
LS-AA-2110, Monthly Date Elements for NRC Emergency Response Organization (ERO) Drill Participation, Rev. 6  
LS-AA-2120, Monthly Date Elements for NRC Drill/Exercise Performance (DEP), Rev. 4  
LS-AA-2130, Monthly Date Elements for NRC Alert Notification System (ANS), Rev. 5

**Section 40A2: Identification and Resolution of Problems**

Procedures

LS-AA-125, Corrective Action Program, Rev. 14  
LS-AA-2100, Monthly Data Elements for NRC Reactor Coolant System (RCS) Leakage, Rev. 5  
MA-AA-716-230-1002, Vibration Analysis/Acceptance Guideline, Rev. 2  
Administrative Procedure 1041, IST Program Requirements, Rev. 43

Miscellaneous

Adverse Condition Monitoring Plan for RC-P-1B Upper Oil Reservoir Level  
IR 1037870 and 1039500, RC-P-1B Oil Leak Complex troubleshooting Plan  
ECR TM-10-00178, Rev. 001, Remote Oil Addition to RC-T-3 For RCP-P-1A/B  
Adverse Condition Monitoring Plan for RC-P-1C Lower Motor Oil Reservoir Level (IR 1022036)  
Apparent Cause Evaluation, RC-P-1C Lower Oil Reservoir Level (IR 1022036), Dated 1/21/10  
Apparent Cause Evaluation, Unusual Wear on Secondary River Water Pump 1B Lineshaft, dated 10/12/03  
ASME OM Code, Subsection ISTB, Inservice Testing of Pumps in Light-Water Reactor Nuclear Power Plants, 1998 Edition through 2000 Addenda  
System Health Report, Nuclear Services River Water, 4Q09, 3Q09, 2Q09, 1Q09, 4Q08, 3Q08, 2Q08, 1Q08, 4Q07, 3Q07, 2Q07, and 1Q07  
System Health Report, Secondary Services River Water, 4Q09, 3Q09, 2Q09, 1Q09, 4Q08, 3Q08, 2Q08, 1Q08, 4Q07, 3Q07, 2Q07, and 1Q07  
System Health Report, Decay Heat River Water, 4Q09, 3Q09, 2Q09, 1Q09, 4Q08, 3Q08, 2Q08, 1Q08, 4Q07, 3Q07, 2Q07, and 1Q07  
System Health Report, Reactor Building Emergency Cooling Water, 4Q09, 3Q09, 2Q09, 1Q09, 4Q08, 3Q08, 2Q08, 1Q08, 4Q07, 3Q07, 2Q07, and 1Q07

Surveillance Test

OP-TM-533-201, IST of DR-P-1A and Valves, performed 12/05/03  
 OP-TM-533-202, IST of DR-P-1B and Valves, performed 01/05/10  
 OP-TM-534-201, IST of RR-P-1A and Valves, performed 01/25/10  
 OP-TM-534-204, IST of RR-P-1B and Valves, performed 03/13/10  
 OP-TM-541-201, IST of NSRW Pumps and Valves, performed 03/26/10

Work Order

R215925

Incident Reports

00370343	00537311	00764836	00888589	00962573
00437613	00576016	00784966	00896394	00967483
00457749	00588898	00793530	00904184	00968846
00478628	00588902	00797950	00912020	00975700
00502786	00590052	00797957	00912991	01008952
00507271	00606238	00799688	00931442	01011956
00508335	00610919	00814352	00939357	01042211
00519240	00634577	00826222	00939461	
00527479	00657026	00849379	00947982	

**Section 40A5: Other Activities**Procedures

CY-AA-170-4000, Radiological Ground Water Protection Program Implementation, Rev. 4  
 CY-AA-170-400, Radiological Ground Water Monitoring Program, Rev. 4  
 CY-TM-170-4160, TMI Radiological Ground Water Protection Program (RGPP), Rev. 4

Other

Reports (various)- Routine Ground Water and Surface Water Monitoring Round Summary of  
 Results, Conclusions, and Recommendations for Future Monitoring Rounds  
 Hydrogeology Investigation Report, September 2006



**LIST OF ACRONYMS**

ADAMS	Agencywide Documents and Management System
ANS	Alert and Notification System
CAP	Corrective Action Plan
CFR	Code of Federal Regulations
DW	Demineralized Water
DRP	Division of Reactor Projects
EDG	Emergency Diesel Generator
EP	Emergency Preparedness
ERO	Emergency Response Organization
ES	Engineered Safeguards
GPI	Groundwater Protection Initiative
HSPS	Heat Sink Protection System
IMC	Inspection Manual Chapter
IR	Issue Report
IST	Inservice Testing
LOR	Licensed Operator Requalification
MR	Maintenance Rule
NCV	Non-cited Violation
NEI	Nuclear Energy Institute
NR	Nuclear River
NRC	Nuclear Regulatory Commission
NS	Nuclear Service
ODCM	Offsite Dose Calculation Manual
OWA	Operator Work-around
PADEP	Pennsylvania Department of Environmental Protection
PARS	Publicly Available Records
PI	Performance Indicator
PMT	Post Maintenance Test
RCP	Reactor Coolant Pump
RPS	Reactor Protection System
SBO	Station Blackout
SG	Steam Generator
SSC	Structures, Systems and Components
TMI	Three Mile Island, Unit 1
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report