



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

November 4, 2011

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 5000289/2011004

Dear Mr. Pacilio:

On September 30, 2011, 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 October 12, 2011, with Mr. Glen Chick, Site Vice President, 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.

Based on the results of this inspection, no findings of significance were identified.

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 610-337-5046 if you have any questions regarding this letter.

Sincerely,

A handwritten signature in cursive script, appearing to read "Travis L. Tate".

Travis L. Tate, Acting Chief
Projects Branch 6
Division of Reactor Projects

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

Enclosure: Inspection Report 05000289/2011004
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

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SUNSI Review Complete: TLT (Reviewer's Initials)

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U.S. NUCLEAR REGULATORY COMMISSION
REGION 1

Docket No: 50-289

License No: DPR-50

Report No: 05000289/2011004

Licensee: Exelon Generation Company

Facility: Three Mile Island Station, Unit 1

Location: Middletown, PA 17057

Dates: July 1 through September 30, 2011

Inspectors: D. Werkheiser, Senior Resident Inspector
J. Heinly, Resident Inspector
R. Nimitz, Senior Health Physicist
D. Kern, Senior Reactor Inspector

Approved by: T. Tate, Acting Chief
Reactor Projects Branch 6
Division of Reactor Projects

Enclosure

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SUMMARY OF FINDINGS

IR 05000289/2011004; 7/1/2011-9/30/2011; Three Mile Island, Unit 1; Integrated Inspection Report.

The report covered a three-month period of baseline inspection conducted by resident inspectors and announced inspections by a regional specialist inspector. 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.

No findings of significance were identified.

REPORT DETAILS

Summary of Plant Status

Three Mile Island, Unit 1 (TMI) began the inspection period at approximately 100 percent power. On September 2, TMI reduced power to perform turbine valve testing and then continued to reduce power to 50 percent to perform planned condenser water box leak search and repairs. Reactor power was returned to 100 percent on September 5 and continued to operate at full power until the end of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (711111.01 – 3 samples of AW)

Impending Adverse Weather (AW)

a. Inspection Scope

The inspectors reviewed Exelon's readiness and response to the listed three adverse weather events. The inspectors reviewed station implementation of OP-AA-108-111-1001, Severe Weather and Natural Disaster Guidelines, Rev. 5 and OP-TM-108-111-1001, TMI Site Inaccessibility Plan, Rev. 3. The inspectors performed station walkdowns, interviewed operators and security officers, and observed plant operations prior to, during, and after each of the events to verify TMI operation was consistent with Technical Specifications (TS), that the security plan was properly implemented, and emergency response organization (ERO) capabilities were maintained in accordance with EP-AA-1009, Radiological Emergency Plan Annex for TMI Station, Rev. 16. As a result of the storms, emergency notification sirens became inoperable after hurricane Irene and Lee. Exelon instituted appropriate compensatory actions to maintain adequate emergency notification, as necessary. The inspectors reviewed the compensatory actions as well as reportability criteria. In addition, the inspectors walked down plant area to identify indications of rain water intrusion and reviewed its potential impact on plant equipment. Documents reviewed are listed in the Attachment.

- Severe thunderstorms and high winds (July 25)
- High winds and precipitation associated with Hurricane Irene (August 26-28)
- High winds, precipitation, and flooding associated with Hurricane Lee (September 7-10)

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)a. Inspection ScopePartial System Walkdowns (71111.04Q – 2 samples)

The inspectors performed partial walkdowns of the following systems:

- 'A' train decay heat system during suction relief valve change-out on the 'B' train on September 14
- 'A' train motor-driven emergency feedwater system during 'B' train testing on September 15

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. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R05 Fire Protection.1 Resident Inspector Quarterly Walkdowns (71111.05Q – 3 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. Documents reviewed are listed in the Attachment. Fire zones and areas inspected included:

- Fire Zone FH-FZ-2, Fuel Handling Building Elevation 305', General Area
- Fire Zone DG-FA-2, Diesel Generator Building, EG-Y-1B Room and Control Panel
- Fire Zone SBO Fuel Oil Tank Room, SBO Diesel Fuel Oil Tank Room

b. Findings

No findings were identified.

.2 Fire Protection – Drill Observation (71111.05A – 1 sample)a. Inspection Scope

The inspectors observed a fire brigade drill scenario conducted on September 6, 2011 that involved a simulated fire in the Intermediate Building 295-foot level, at the instrument air compressor cubicle. The inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that Exelon personnel identified deficiencies, openly discussed them in a self-critical manner at the debrief, and took appropriate corrective actions as required. The inspectors evaluated specific attributes as follows:

- Proper wearing of turnout gear and self-contained breathing apparatus
- Proper use and layout of fire hoses
- Employment of appropriate fire-fighting techniques
- Sufficient fire-fighting equipment brought to the scene
- Effectiveness of command and control
- Search for victims and propagation of the fire into other plant areas
- Smoke removal operations
- Utilization of pre-planned strategies
- Adherence to the pre-planned drill scenario
- Drill objectives met

The inspectors also evaluated the fire brigade's actions to determine whether these actions were in accordance with Exelon's fire-fighting strategies. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R06 Flood Protection (71111.06 – 1 sample)a. Inspection Scope

On July 19, the inspectors reviewed the UFSAR, the applicable flooding analysis, plant procedures, and performed visual inspections of flood barriers, system boundaries, water line break sources, and floor drains located in the makeup pump cubicles vault where internal flooding could adversely affect safety related systems needed for safe shutdown of the plant. Specifically, the inspectors reviewed the design and execution of flood indications and mitigation strategies for internal flooding of the cubicles. The inspectors also reviewed the corrective action program to determine if internal flooding mitigation and indication deficiencies were identified and corrected. Documents reviewed are listed in the Attachment.

c. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11Q – 1 sample)Resident Inspector Quarterly Reviewa. Inspection Scope

On August 19, the inspectors observed licensed operator requalification training at the control room simulator for the 'E' operator crew and pre-simulator demonstration on the to-be-installed next outage digital control rod system. The inspectors observed the operators' simulator drill performance and compared it to the criteria listed in TMI Operational Simulator Scenario TQ-TM-106-622-S001, DCRS Demonstration, and TQ-TM-106-S005, Feedwater Pump Trip, Steam Generator Tube Leak and Emergency Declaration.

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 verified the accuracy and timeliness of the emergency classification made by the shift manager and TS action statements entered by the crew. The inspectors evaluated training instructor effectiveness in recognizing and correcting individual and operating crew errors. The inspectors attended the post-drill critique and reviewed the written crew critique in order to evaluate the effectiveness of problem identification.

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. Documents reviewed are listed in the Attachment.

- Fire service pump 1 overheat during testing, July 15, 2011 (IR 1240433)
- Decay river system piping integrity deficiencies, September 13, 2011 (IR 1262612)

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 60.65(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. Documents reviewed are listed in the Attachment

- Station planned activities during high grid load conditions and high Susquehanna River temperature on July 22
- Elevated station risk during adverse weather conditions and planned station blackout diesel generator maintenance on July 25
- Planned surveillance testing on the heat sink protection system and the preservation of 'green' risk condition by crediting operator actions to manipulate the emergency feedwater (EFW) injection valves on August 9
- The planned replacement of the 'A' decay heat relief valve, DH-V-60, and the review of station's evaluations to ensure availability of the decay heat removal system on August 31

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15 – 2 samples)

a. Inspection Scope

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

- Issues identified in IR 01253738 regarding nuclear service to reactor river system check valve, NS-V-205, failing to seat on August 21

- Nuclear service to reactor river system cross connect valve, NS-V-135, failure on September 1

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. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 1 sample)

Temporary Modifications

a. Inspection Scope

The inspectors reviewed the temporary modifications listed below to determine whether the modifications affected the safety functions of systems that are important to safety. The inspectors reviewed 10 CFR 50.59 documentation and post-modification testing results, and conducted field walkdowns of the modifications to verify that the temporary modifications did not degrade the design bases, licensing bases, and performance capability of the affected systems. Documents reviewed are listed in the Attachment.

- Engineering Change Request (ECR) 11-00313, Rev. 1, Technical Evaluation to Justify Addition of Underwater Demineralizer in Spent Fuel Pool

b. Findings

No findings were identified.

1R19 Post Maintenance Testing (71111.19 – 6 samples)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities 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. Documents reviewed are listed in the Attachment.

- On July 15, the 'B' spent fuel pool cooling pump motor was replaced during planned preventive maintenance for the system. Operators performed 1300-3EB, IST of "B" SF Pump and Valves, Rev. 3 (WO R2180708) as a post maintenance test
- On July 27, maintenance activities to emergency diesel generator, EG-Y-1A, ventilation fan, AH-E-29A (AR A2282771)
- On August 4, the control building emergency ventilation filter, AH-F-3A, was removed from service for replacement of the selected charcoal filter banks. Operators performed 1303-11.13, Control Room Filtering System Test, Rev. 21 as a post maintenance test for operability (WO R2166809)
- On August 24, replacement of ESAS relays and subsequent testing and visual inspection per 1303-5.1A (WO R218295301)
- On September 17, testing of 'B' reactor river water pump after maintenance activities (OP-TM-534-204)
- On September 21, technicians replaced relays in the ESAS and operations performed post maintenance testing in accordance with 1303-5.2A, "A" Emergency Loading Sequence and HPI Logic Channel/Component test, Rev. 6 (WO R2184413)

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors observed activities during the quarter to assess Exelon's preparation for a refueling outage. The inspectors reviewed or observed the following:

- New fuel receipt and inspection, including the movement of nuclear fuel in the spent fuel pool
- Attended pre-outage readiness meetings
- Observed the setup of scaffolding in safety-related and radiologically controlled areas

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 5 samples)

a. Inspection Scope (5 routine surveillance samples)

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. Documents reviewed are listed in the Attachment. The inspectors reviewed the following surveillance tests:

- On July 13, 3303-A3, Fire Pump Capacity Testing, Rev. 17
- On August 5, OP-TM-214-254, BS Leakage Exam Train B, Rev. 3, performance of a leakage exam on the 'B' building spray system
- On August 2, ST1303-11.37A, HSPS – OTSG Level and Pressure Channel I Tests, Rev. 28
- On September 15, OP-TM-300-302, Quadrant Power Tilt and Axial Power Imbalance Using the Out-of-Core Detector System, Rev. 1
- On September 30, ST1302-6.14, PORV and Code Safety D/P Monitors, Rev. 15b

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06 - 2 samples)

Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of routine Exelon emergency drills on August 8 and September 20, 2011 to identify any weaknesses and deficiencies in the classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator and technical support center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the station drill critique to compare inspector observations with those identified by Exelon staff in order to evaluate Exelon's critique and to verify whether Exelon staff was appropriately identifying weaknesses and entering them into the corrective action program. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety (OS)

2RS01 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 Part 20, applicable Technical Specifications, and applicable station procedures.

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. Documents reviewed are listed in the Attachment.

Radiological Hazard Assessment

The inspectors discussed plant operations to identify any significant new radiological hazard for onsite workers or members of the public. The inspectors assessed the potential impact of the changes (e.g., fuel integrity status) and the implementation of periodic monitoring, as appropriate, to detect and quantify the radiological hazard.

The inspectors toured various radiological controlled areas and reviewed radiological surveys from selected plant areas (auxiliary building and spent fuel pool areas) to verify that the thoroughness and frequency of the surveys were appropriate for the given radiological hazard. The inspectors selectively reviewed radiological controls for change-out of the make-up filter radiation work permit (RWP) No. 11-14.

The inspectors selectively reviewed posted radiological surveys during plant tours and compared measurements to independent survey measurements made by the inspectors. During plant tours, the inspectors selectively challenged three Locked High Radiation Areas doors.

Instructions to Workers

The inspectors toured the radiological controlled areas and reviewed the labeling of radioactive material containers.

Problem Identification and Resolution

The inspectors selectively verified through review of corrective action documents that problems associated with radiation monitoring and exposure control were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee corrective action program. The inspectors also selectively evaluated the appropriateness of the corrective actions for a selected sample of problems documented. (See Section 4OA2)

b. Findings

No findings were identified.

2RS02 Occupational ALARA Planning and Controls (71124.02)

a. Inspection Scope

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

The inspectors determined the site-specific trends in collective exposures (using NUREG-0713, "Occupational Radiation Exposure at Commercial Nuclear Power Reactors and Other Facilities," and plant historical data) and source term.

The inspectors reviewed site-specific procedures associated with maintaining occupational exposures as low as reasonably achievable (ALARA) including processes used to estimate and track exposures from specific work activities. Documents reviewed are listed in the Attachment.

Radiological Work Planning

The inspectors obtained a list of completed and planned work activities ranked by actual or estimated exposure (> 5 person-rem or radiological risk significant). The inspectors attended a monthly Station ALARA Committee meeting (No. 11-07).

The inspectors reviewed the ALARA work activity evaluations (reactor disassembly/reassembly, fuel movement, scaffolding, steam generator inspection, cavity decontamination), exposure estimates, and exposure mitigation requirements. The inspectors determined if the licensee reasonably grouped the radiological work into work activities, based on historical precedence, industry norms, and/or special circumstances. The inspectors reviewed shutdown coolant clean-up plans.

The inspectors selectively verified that the licensee's planning identified appropriate dose mitigation features; considered, commensurate with the risk of the work activity, alternate mitigation features; and defined reasonable dose goals. The inspectors selectively verified that ALARA requirements were being incorporated into work procedure and RWP documents.

Verification of Dose Estimates and Exposure Tracking Systems

The inspectors selected work activities (> 5 person-rem work activities and selected risk significant activities) and reviewed the assumptions and basis (including dose rate and man-hour estimates) for the current annual collective exposure estimate for reasonable accuracy. The inspectors reviewed applicable procedures to determine the methodology for estimating exposures from specific work activities and the intended dose outcome.

The inspectors verified, for the selected work activities, that the licensee had established measures to track, trend, and if necessary to reduce, occupational doses for ongoing work activities. The inspectors selectively reviewed and verified that trigger points or

criteria were established to prompt additional reviews and/or additional ALARA planning and controls.

The inspectors evaluated the licensee's method of adjusting exposure estimates, or re-planning work, when unexpected changes in scope or emergent work were encountered.

Source Term Reduction and Control

The inspectors discussed, and used licensee records to determine historical trends and current status of significant tracked plant source terms known to contribute to elevated facility aggregate exposure. The inspectors determined if the licensee was making allowances or developing contingency plans for expected changes in the source term as the result of changes in plant fuel performance issues or changes in plant primary chemistry.

Problem Identification and Resolution

The inspectors selectively verified that problems associated with ALARA planning and controls were being identified by the licensee at an appropriate threshold were entered into the corrective action program for resolution. (See Section 4OA2)

b. Findings

No findings were identified.

2RS03 In-Plant Airborne Radioactivity Control and Mitigation (71124.03 - 1 sample)

a. Inspection Scope

The inspectors reviewed the UFSAR to identify areas of the plant designed as potential airborne radiation areas and any associated ventilation systems or airborne monitoring instrumentation. The inspectors reviewed the UFSAR for overview of the respiratory protection program and a description of the types of devices used, as applicable. The inspectors selectively reviewed the UFSAR, Technical Specifications, and emergency planning documents, to identify location and quantity of respiratory protection devices stored for emergency use.

The inspectors reviewed the licensee's procedures for maintenance, inspection, and use of respiratory protection equipment including self-contained breathing apparatus (SCBA) and procedures for air quality maintenance. Documents reviewed are listed in the Attachment.

The inspectors reviewed the reported PIs to identify any related to unintended dose resulting from intakes of radioactive materials.

Engineering Controls

The inspectors selectively discussed, reviewed, and verified that the licensee uses ventilation systems as part of its engineering controls (in lieu of respiratory protection devices) to control airborne radioactivity. The inspectors reviewed guidance for use of installed plant systems, such as containment purge, spent fuel pool ventilation, and

auxiliary building ventilation, and verified that the systems were used, to the extent practicable, during high-risk activities.

The inspectors selectively discussed and reviewed two installed ventilation systems used to mitigate the potential for airborne radioactivity, to verify that ventilation airflow capacity, flow path (including the alignment of the suction and discharges), and filter/charcoal unit efficiencies were consistent with maintaining concentrations of airborne radioactivity in work areas below the concentrations of an airborne area to the extent practicable.

The inspectors selectively evaluated installed systems to monitor and warn of changing airborne concentrations in the plant. The inspectors reviewed and discussed alarms and set-points to prompt licensee/worker action to ensure that doses were maintained within the limits of 10 CFR Part 20 and ALARA.

The inspectors reviewed procedures that established trigger points for evaluating levels of airborne beta-emitting and alpha-emitting radionuclides.

Use of Respiratory Protection Devices

The inspectors selectively verified that the licensee provides respiratory protective devices such that occupational doses were ALARA. The inspectors reviewed and discussed the licensee evaluation process to determine the need for respiratory protection. The inspectors verified that the licensee had established means to verify that the level of protection (protection factor) provided by the respiratory protection devices during use was at least as good as that assumed in the licensee's work controls and dose assessment.

The inspectors selectively verified that respiratory protection devices, used to limit the intake of radioactive materials, were certified by the National Institute for Occupational Safety and Health/Mine Safety and Health Administration or have been approved by the NRC per 10 CFR 20.1703(b).

The inspectors selectively reviewed records of air testing for supplied-air devices and SCBA bottles. The inspectors selectively verified that air used in the devices met or exceeded Grade D quality.

The inspectors selected five individuals, qualified to use respiratory protection devices, and verified that they had been deemed fit to use the devices.

The inspectors selectively evaluated respiratory equipment storage, maintenance, and quality assurance. The inspectors observed the physical condition of the device components (mask or hood, harnesses, air lines, regulators, air bottles, etc.) and reviewed records of routine inspection for each. The inspectors reviewed, as available, records of maintenance on the vital components (e.g., pressure regulators, inhalation/exhalation valves, hose couplings). The inspectors verified that, as applicable, onsite personnel assigned to repair vital components received vendor-provided training or relied on vendor personnel to repair the devices.

Self-Contained Breathing Apparatus for Emergency Use

The inspectors reviewed the status and surveillance records of three SCBAs (Pack 41, 1, and 2) staged in-plant for use during emergencies. The inspectors evaluated the licensee's capability for refilling and transporting SCBA air bottles to and from the control room and operations support center during emergency conditions.

The inspectors selected three individuals on control room shift crews, and three individuals from designated departments currently assigned emergency duties. The inspectors determined the individuals were trained and qualified in the use of SCBAs (including personal bottle change-out). The inspectors determined that personnel assigned to refill bottles were trained and qualified for that task. The inspectors verified that appropriate mask sizes and types were available for use.

The inspectors observed operating shift personnel in the control room to verify that they had no facial hair that would interfere with the sealing of the mask to the face. Also, the inspectors verified that respirator use vision correction lenses were readily available in the control room, as appropriate.

The inspectors reviewed the most recent inspection history for the recently obtained SCBA units used to support operator activities during accident conditions and designated as "ready for service." The inspectors discussed maintenance or repairs on an SCBA unit's vital components. The inspectors verified periodic air cylinder hydrostatic testing was documented and up to date. The inspectors discussed supplies of bottles and filling of cylinders.

Problem Identification and Resolution

The inspectors selectively verified that problems associated with the control and mitigation of in-plant airborne radioactivity were being identified by the licensee at an appropriate threshold and addressed for resolution in the corrective action program. (See Section 4OA2)

b. Findings

No findings were identified.

2RS04 Occupational Dose Assessment (71124.04 - 1 sample)

a. Inspection Scope

The inspectors selectively reviewed the results of radiation protection program audits related to internal and external dosimetry (e.g., licensee's quality assurance audits, self-assessments, or other independent audits).

The inspectors reviewed the most recent National Voluntary Laboratory Accreditation Program (NVLAP) accreditation report to determine the status of the licensee's dosimetry accreditation.

The inspectors selectively reviewed licensee procedures associated with dosimetry operations, including issuance/use of external dosimetry (routine, multi-badging,

extremity, neutron, etc.), assessment of internal dose (operation of whole body counter, assignment of dose based on derived air concentration (DAC) hours, urinalysis, etc.), and evaluation of and dose assessment for radiological incidents (distributed contamination, hot particles, loss of dosimetry, etc.). The inspectors selectively verified that the licensee had established procedural requirements for determining when external and internal dosimetry was required. Documents reviewed are listed in the Attachment.

External Dosimetry

The inspectors verified that the licensee's personnel dosimeters that required processing were NVLAP accredited. The inspectors reviewed irradiation test categories for each type of personnel dosimeter used to determine if they were consistent with the types and energies of the radiation present, and the way that the dosimeter was being used (e.g., to measure deep dose equivalent, shallow dose equivalent (SDE), or lens dose equivalent. The inspectors evaluated supplemental means for dose assessment for exposure to low energy beta exposures.

The inspectors evaluated onsite storage of dosimeters before their issuance, during use, and before processing/reading including guidance provided to radiation workers with respect to care and storage of dosimeters.

The inspectors determined if the licensee used a "correction factor" to address the response of the electronic dosimeter (ED) as compared to thermoluminescent dosimeter for situations when the ED must be used to assign dose.

The inspectors selected available dosimetry occurrence reports or corrective action program documents to review for adverse trends related to electronic dosimeters, such as interference from electromagnetic frequency, dropping or bumping, or failure to hear alarms to determine if the licensee had identified any trends and implemented appropriate corrective actions.

Internal Dosimetry

The inspectors selectively reviewed procedures used to assess dose from internally deposited nuclides using whole body counting equipment (e.g., methods for determining if an individual is internally or externally contaminated, release of contaminated individuals, determination of entry route (ingestion, inhalation), and assignment of dose).

For whole body counting, the inspectors selectively verified that the frequency of such measurements was consistent with the biological half-life of the potential nuclides available for intake.

The inspectors selectively evaluated screening for intakes (e.g., passive monitoring using portal monitors) and the minimum detectable activity (MDA) of the instrument to determine if the MDA was adequate to determine the potential for internally deposited radionuclides sufficient to prompt additional investigation.

The inspectors selectively evaluated three whole body counts to ensure: appropriate sensitivity for the potential radionuclides of interest; the appropriate nuclide library was used; and any anomalous count peaks/nuclides indicated in each output spectra received appropriate disposition, as applicable. The inspectors also reviewed the licensee's

10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste," analyses to ensure that the libraries include appropriate gamma-emitting nuclides. The inspectors also evaluated dose determination for hard-to-detect nuclides.

The inspectors selectively evaluated the licensee program for in-vitro monitoring (i.e., urinalysis and fecal analysis) including collection and storage of samples. The inspectors discussed the counting lab's quality assurance program.

The inspectors selectively reviewed the adequacy of the licensee's program for dose assessments based on airborne/DAC monitoring including lower limits of detection and procedural guidance used to assess dose when using respiratory protection.

The inspectors selectively reviewed and assessed the licensee's internal dose assessments, as available.

Special Dosimetric Situations

The inspectors selectively verified that the licensee informed workers, as appropriate, of the risks of radiation exposure to the embryo/fetus, the regulatory aspects of declaring a pregnancy, and the specific process to be used for (voluntarily) declaring a pregnancy.

The inspectors selected one individual who had declared their pregnancy during the current assessment period to verify that the licensee's radiological monitoring program (internal and external) for declared pregnant workers was technically adequate to assess the dose to the embryo/fetus. The inspectors reviewed exposure and monitoring controls.

The inspectors selectively reviewed the licensee's methodology for monitoring external dose in situations in which non-uniform fields were expected or large dose gradients would exist (e.g., diving activities and steam generator jumps). The inspectors selectively verified that the licensee established criteria for determining when alternate monitoring techniques (i.e., use of multi-badging or determination of effective dose equivalent for external exposures using an approved method) were to be implemented.

The inspectors selectively reviewed use of multi-badging for two individuals during the current assessment period.

The inspectors selectively reviewed the licensee's program for shallow dose assessment. The inspectors evaluated the licensee's methods for calculating SDE from distributed skin contamination or discrete radioactive particles.

The inspectors evaluated the licensee's neutron dosimetry program, including dosimeter type(s) and/or survey instrumentation. The inspectors selected one neutron exposure situation (at-power containment entries) to verify use of dosimetry and determination of dose including use of ratios, as applicable.

Problem Identification and Resolution

The inspectors selectively verified that problems associated with occupational dose assessment were being identified by the licensee and entered into the corrective action program for resolution. (See Section 40A2)

b. Findings

No findings were identified.

4. **OTHER ACTIVITIES**

4OA1 Performance Indicator Verification (71151 - 1 sample)

Reactor Coolant System Specific Activity

a. Inspection Scope

The inspectors reviewed Exelon's submittal for the RCS specific activity performance indicator for the period October 1, 2010 through September 30, 2011. To determine the accuracy of the performance indicator data reported for this period, the inspectors used definition and guidance contained in NEI document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors also reviewed RCS sample analysis and control room logs of daily measurements.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152 – 2 annual samples)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify 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 Radiation Safety (71124.01, 71124.02, 71124.03, 71124.04)

a. Inspection Scope

The inspectors selectively reviewed corrective action documents to determine if identified problems were entered into the corrective action program for resolution and to evaluate Exelon's threshold for entering issues into the program. The review included a check of possible repetitive issues, such as radiation worker or radiation protection technician

errors. Also, selectively reviewed were recent audits and assessments, as appropriate and corrective action program documents. Documents reviewed are listed in the Attachment.

The review was against the criteria contained in 10 CFR Part 20, Technical Specifications, and station procedures.

b. Findings

No findings were identified.

.3 Annual Sample: Appropriate PM's for Critical Components (1 sample)

a. Inspection Scope

The inspectors performed an in-depth review of Exelon's root cause analysis and corrective actions associated with IR 1115086, unexpected plant runback and turbine trip. Specifically, a signal converter from the integrated control system (ICS) to the digital turbine control system (DTCS) had failed downscale resulting in a turbine trip.

The inspectors assessed Exelon's problem identification threshold, cause analyses, extent of condition reviews, compensatory actions and prioritization and timeliness of corrective action 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 action taken to the requirements of Exelon's corrective action program and 10 CFR 50, Appendix B. In addition, the inspectors observed maintenance activities and interviewed engineering personnel 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 evaluation determined the ICS to DTCS signal converter failed due to age-related degradation. The GPU design change process (EP-005), that installed the signal converter in 1995, did not identify the need for a PM to periodically calibrate and replace the signal converter. The deficient design change process was identified as one root cause for the failure. The manufacturer confirmed the mean time between failures of the signal converter was approximately 10.4 years and a 10 year replacement PM should have been performed. The signal converter was in service for 15 years. Corrective actions to address the gaps in the design change process were completed after the implementation of the Exelon design procedures (CC-AA-192) in 2002. The Exelon modification process incorporates a review of all components associated with a modification and ensures that the appropriate PMs are assigned.

Additionally, in 2007, Exelon implemented a performance centered maintenance (PCM) program (MA-AA-716-210) that contained templates with recommended PM actions and intervals for specific components. Exelon identified that during the implementation of the program, components not covered under a specified template were reviewed on a system level, not an individual component level. The ICS to DTCS signal converter was not

associated with a specific PCM template therefore; the engineering review did not identify the component and assign appropriate PMs. Exelon initiated a comprehensive corrective action review of components installed in critical, reactivity management risk, and operational risk systems to validate that appropriate PM actions and intervals are assigned to the components. This extent of condition review would incorporate all components installed under the previous design change process, EP-005. In addition, MA-AA-716-210 was updated to provide clarity on required actions for components with no designated PCM templates. Engineering engagement with subject matter experts, the vendor, and operating experience were incorporated into the decision making process for appropriate PM assignments.

The inspectors reviewed Exelon's corrective actions to prevent the recurrence of a failure of a critical plant component due to deficient PMs. The inspectors performed a risk-informed sample of systems to validate the identification, characterization and prioritization of component PM deficiencies identified by Exelon's extent of condition review. The inspectors concluded that an adequate methodology was used to identify components with deficient PMs and that appropriate prioritization in the work management process existed commensurate with the components safety significance.

The updated PCM and design modification procedures were reviewed to confirm the implemented revisions would adequately identify components that require PMs and assign the appropriate actions and intervals for maintenance. Furthermore, the inspectors performed field observations during the replacement of critical components identified as a result of the extent of condition review. The review yielded no inadequacies with the corrective actions to prevent recurrence.

4 Annual Sample: Maintenance Procedure Quality and Adherence (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/or adherence deficiencies. Several of the specific deficiencies identified were associated with procedures used to verify operability of engineered safeguards actuation system (ESAS) and reactor protection system (RPS) functions. Exelon documented the concern in IR 1203015 and performed a multi-disciplined root cause evaluation (RCE). Based on the risk importance of the ESAS and RPS functions, the inspectors performed an in-depth review of Exelon's RCE and corrective actions associated with IR 1203015.

Additionally, the inspectors independently reviewed eleven periodic test procedures used to verify operability of safety related ESAS and RPS functions. The review was performed to evaluate procedure adequacy to support equipment operability, worker procedure adherence during the last two performances of each procedure, 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 3 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.

The RCE documented the root causes to be (1) failure to reinforce site standards for procedure adherence and (2) failure to apply resources to develop and maintain maintenance department procedures. Principle corrective actions included establishing a 4-year procedure upgrade project 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 RCE identified that similar maintenance procedure deficiencies had been identified in the past, but were not successfully resolved in the past. Accordingly, the RCE established several individual corrective actions in the future to evaluate the effectiveness of IR 1203015 corrective actions. The inspectors concluded the RCE scope and depth were comprehensive, the evaluation was probing, and the resulting corrective actions/assignments were appropriate.

The inspectors determined that most procedure quality related IRs were properly corrected. The inspectors identified several additional procedure quality and/or adherence deficiencies which had not been identified by station personnel. Examples included inaccurate operability determination guidelines, out-of-tolerance instrument readings not identified by technicians, untimely instrument performance trending, extent-of-condition reviews not performed, and incomplete corrective actions. Station personnel initiated IRs to address each issue in the corrective action program (IRs 1265599, 1265602, 1265603, 1265609, 1265613, 1265618, 1265621, and 1265625). Each deficiency was minor in nature, and did not adversely affect operability of the safety related function being tested. The inspectors reviewed these issues with maintenance managers and concluded these deficiencies were additional examples of the problems identified and addressed in the RCE. The inspectors concluded the scope of corrective actions for the RCE remained appropriate to correct the root cause of these deficiencies.

4OA3 Event Follow-up (71153 – 1 sample)

.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 reported the event in accordance with 10 CFR Parts 50.72 and 50.73. The inspectors verified the licensee's assessment of seismic activity being below the operating basis earthquake magnitude for TMI. 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 the Attachment.

- Declaration of Unusual Event due to seismic activity on August 23

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On October 12, 2011, the inspectors presented the inspection results to Mr. Glen Chick, Site Vice President, 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

Enclosure

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

D. Atherholt	Manager, Regulatory Assurance
P. Bennett	Manager, Design Engineering - Mechanical
G. Chick	Site Vice President
D. Divittore	Manager, Radiological Engineering
J. Dullinger	Operations Manager
M. Fitzwater	Senior Regulatory Assurance Engineer
M. Hardy	System Engineer-Flood Protection
C. Incorvati	Director, Maintenance
J. Karkoska	Manager, Site Security
M. Kersey	Risk Management Engineer
M. Krause	Component Monitoring Engineer
R. Libra	Plant Manager
R. Masoero	System Engineer-Inservice Testing Program Owner
W. McSorley	Procedures and Flood Protection
D. Neff	Manager, Emergency Preparedness
S. Nowak	Component Monitoring Organization Specialist – Instrumentation & Control
T. Orth	Manager, Chemistry
J. Piazza	Senior Manager, Design Engineering
M. Reed	System Engineer
C. Robles	System Engineer
P. Steiner	Assistant Maintenance Director
L. Weber	Chemist
S. Wilkerson	Manager, Design Engineering – Electrical and Instrumentation & Control
M. Willenbecher	Supervisor, Planning
G. Wright	Senior Work Week Manager
M. Wyatt	Manager, Training Support
B. Young	Manager, Instrumentation and Control Department

Other

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

None

LIST OF DOCUMENTS REVIEWED**Section 1R01: Adverse Weather****Procedures**

EP-AA-1009, TMI Emergency Action Level Matrix
 OP-TM-AOP-002, Flood, Rev. 3 and Rev. 4
 OP-AA-108-111-1001, Severe Weather and Natural Disaster Guidance, Rev. 1
 OP-TM-108-111-1001, TMI Inaccessibility Plan, Rev. 1
 OP-TM-122-901, Inflate Aux & FHB Door Seals, Rev. 1
 MA-TM-122-901, Install Unit 1 Flood Barriers, Rev. 1

Drawings

UFSAR, Figure 2.6-15, Dike Freeboard – Design Flood

Other

TMI-1, TS 3.14.2, Flood Condition for Placing the Unit in Hot Standby
 TMI area National Weather Service and USGS data, dated September 8-12, 2011
 TMI-1 Shift Operations Logs dated July 25, 2011
 TMI Station News Flashes, dated September 8-12, 2011
 IRs: 1256396 1256524 1256356 1256341 1256327 1257429
 1257518 1262822 1262803 1263647 1263310
 UFSAR, Section 2.6, Hydrology and Flood Studies

Section 1R04: Equipment Alignment**Other**

Control Room Status logs, September 14 & 15, 2011
 DH & EFW configuration control diagrams, dated September 14 & 15, 2011

Section 1R05: Fire Protection**Procedures**

1038, Administrative Controls-Fire Protection Program, Rev. 76
 1301-8.2, Diesel Generator Major Inspection (Mechanical), Rev. 90
 OP-AA-201-003, Fire Drills, Rev. 12
 OP-MA-201-007, Fire Protection System Impairment Control, Rev. 6

Other

CC-AA-309-101, Engineering Technical Evaluations, Rev. 11
 IRs: 1253065 1255002
 Pre-Fire Plan for TMI-1, IB, 295' Level Air Compressor Cubicle

Section 1R06: Flood Protection Measures**Procedures**

OP-TM-102-106, Control of Time Critical Operator Actions at TMI, Rev. 0
 OP-TM-214-251, BS and DH Floor Drain Inspection, Rev. 1
 U-17, Zurn Floor Drain Inspection, Rev. 14

Drawings

302-719, Sump Pump and Drainage System, Rev. 62

Other

IR 1247409 1249444 1262908
 WO R2119206

Section 1R12: Maintenance Effectiveness**Procedures**

ER-AA-310, Implementation of the Maintenance Rule, Rev. 8

OP-TM-533-252, DR Train B Leakage Exam, Rev. 6

Other

Technical Evaluation 1203847-02, 7/13/2011

ASME, IWD-5000, System Pressure Tests, 1989

ECR 02-00842, Replacement Controller for FS-P-1

ECR 03-00397, Replacement Controller for FS-P-3

Operability Evaluation 03-25, Rev. 3

IRs:	1203858	1262612	1122773	1126672	1134244	1141236
	1141245	1161740	1190664	1213407	1215471	1238827
	1102848	1105364	1106340	1106504	1110119	1110971
	1139305	1153968	1179612	1221550	1229703	1239787
	1240433	1247030				

WOs: R2021614 R2106531 R2181089 R2126124

Section 1R13: Maintenance Risk Assessments and Emergent Work Control**Procedures**

1082.1, TMI Risk Management Program, Rev. 8

1303-11.37B, HSPS – OTSG Level and Pressure Channel II Tests, Rev. 30

ER-AA-310, Implementation of the Maintenance Rule, Rev. 8

MA-AA-736-610, Application of Freeze Seal to all Piping, Rev. 7

OP-TM-212-201, IST of DH-P-1A and Valves from ES Standby Mode, Rev. 9

OP-TM-424-212, IST of EF-V-30s and EF-V-52s, Rev. 5

OP-TM-999-092, Functional Test of DH-V-59A/B, Rev. 0

OS-24, Conduct of Operations During Abnormal and Emergency Events, Rev. 18

WC-AA-101, On-Line Work Control Process, Rev. 18

Drawings

302-082, Emergency Feedwater Flow Diagram, Rev. 24

302-640, Decay Heat Removal Flow Diagram, Rev. 83

302-670, Chemical Addition Flow Diagram, Rev. 34

Other

TMI-1 Shift Operations Logs dated July 22 & 25, 2011

IRs: 591795 1015513 1252560 1201013 01244227

WOs: R2086066 C2020306 R2170964 R2112312

Section 1R15: Operability Evaluations**Procedures**

OP-AA-108-111, Adverse Condition Monitoring and Contingency Plan, Rev. 8

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-534-228, IST of RR-P-1B and Valves During Cold Shutdown, Rev. 2

OP-TM-534-901, RB Emergency Cooling Operations, Rev. 11

DrawingsOther

ECR TM 02-00755, NS/RR Crosstie Excess Flow C/V NS-V-135 Install, Rev. 1
 IR 1258323 1005866 01250417 1245299 1253738
 WO C2024227

Section 1R18: Plant ModificationsProcedures

CC-AA-102, Design Input and Configuration Change Impact Screening, Rev. 20
 CC-AA-103, Configuration Change Control, Rev. 21
 OI-TM-201, Installation and Operation of the Underwater Demineralizer, Rev. 0

Other

EEC ECR 11-00313, Tech Evaluation to Justify Addition of Underwater Demin to SFP, Rev. 1
 50.59 Evaluation for ECR 11-00313
 PORC 2011-07 Minutes, dated August 27, 2011

Section IR19: Post Maintenance TestingProcedures

1303-5.5A, Control Room Emergency Filtering System "A" Operational Test, Rev. 3
 1303-11.13, Control Room Filtering System Test, Rev. 21
 1420-Y-11, ESAS Channel Relay Maintenance, Rev. 29
 OP-TM-642-301, ES Actuation Relay Inspection, Rev. 2
 U-36, Ventilation Filter DOP and Halide Testing, Rev. 15

Drawings

302-630, Spent Fuel Cooling System Flow Diagram, Rev. 31
 302-842, Control Building and Machine Shop Ventilation, Rev. 57

Other

VM-TM-1223, Ventilation Charcoal Filter Systems, 7/17/70
 1QM029, Charcoal Absorber Refilling Procurement Specification
 ASME N510-2007, Testing of Nuclear Air Treatment Systems, 12/7/07
 WO: R2162630 R2185235 C2025776 C2021040 R2180708 R2151050
 R2122469 R2122191 C2025842 C2026150 R2184413
 IR: 1226352 504314 516401 01244320 01244594 01255125

Section IR22: Surveillance TestingProcedures

E-1, Vibration Monitoring for Rotating Equipment, Rev. 22
 ER-AA-335-015, VT-2 Visual Examination, Rev. 10
 OP-TM-214-202, IST of BS-P-1B and Valves, Rev. 12
 WC-TM-430, Surveillance Testing Program, Rev. 0
 WC-TM-430-1001, Surveillance Testing Program Database Interface and Maintenance, Rev. 1
 1302-6.14, PORV and Code Safety D/P Monitors, Rev. 15 and 15a
 3303-A3, Fire Pump Capacity Testing, Rev. 17

Drawings

302-231, Fire Service Water Flow Diagram, Rev. 107
 302-712, Reactor Building Spray Flow Diagram, Rev. 49

Other

IR	1251616	1247030	1261371	0125074*	01248690*
WO	R2146680	R2181860	R2165086	R2151207	

* - IR as a result of inspection

Section 1EP6: Drill EvaluationProcedures

EP-AA-1009, Exelon Nuclear Radiological Emergency Plan Annex for TMI Station, Rev. 17
 LS-AA-1150, Event Notifications, Rev. 0
 OP-TM-EOP-001, Reactor Trip, Rev. 10

Other

NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Rev. 6.
 TMI 2011 Full Scale Drill Evaluation Report, August 9, 2011
 TMI 2011 Emergency Preparedness Scenario Manual dated September 20, 2011
 IRs: 1249760 1266699 1257973 1266162 1265887 1265597
 1265628 1265564

Section 2RS01: Access Control to Radiologically Significant AreasDocuments

Radiological Survey Posting
 Radiation Work Permits (RWP 10-03, 11-14)

Section 2RS02: Occupational ALARA Planning and ControlsProcedures

RP-AA-400, ALARA Program, Rev. 8
 RP-AA-400-1003, Work Group Exposure Reduction Plans
 RP-AA-400-1004, Emergent Dose Control and Authorization, Rev. 3
 RP-AA-400-1007, Elevated Dose Rate Response Planning, Rev. 0
 RP-AA-400-1008, Exposure Goal Recovery Plan, Rev. 0
 RP-AA-400-2000, Dose Zealot, Rev. 0
 RP-AA-401, Operational ALARA Planning and Controls, Rev. 13
 RP-AA-401-1002, Radiological Risk Management, Rev. 0
 RP-TM-401-1002, Three Mile Island Outage ALARA Planning and Control, Rev. 0
 RP-AA-402, Radiation Protection Dose Excellence Planning, Rev. 2
 RP-AA-441, Evaluation and Selection Process for Radiological Respirator Use, Rev. 4
 6610-IMP-3282.01, Installation of Temporary Shielding

Documents

Department Dose Reduction Plans (2011)
 General Source Term Data – SMRP Survey Points
 Chemistry Shutdown Clean-up Plan T1R19
 Dose Zealot Meeting Notes
 ALARA Reviews (Radiation Work Permit ALARA Plans (525, 526, 411, 514, 523, 602))

Section 2RS03: In-Plant Airborne Radioactivity Control and MitigationProcedures

RP-300, Radiological Survey Program, Rev. 7
 RP-AA-301, Radiological Air Sampling Program, Rev. 4
 RP-AA-302, Determination of Alpha Levels and Monitoring, Rev. 4

RP-AA-440, Respiratory Protection Program, Rev. 9
 RP-AA-441, Evaluation and Selection Process for Radiological Respirator Use, Rev. 4
 RP-AA-443, Quantitative Respirator Fit Testing, Rev. 8
 RP-AA-444, Controlled Negative Pressure (CNP) Fit Testing, Rev. 0
 RP-AA-700-1300, Calibration, Operation, and Source Check of the Eberline Beta Air
 Monitor Model AMS-3, Rev. 1
 RP-AA-825, Maintenance, Care and Inspection of Respiratory Protection Equipment, Rev. 3
 RP-AA-870-1002, Use of Vacuum Cleaners in Radiological Controlled Area, Rev. 2
 RP-AA-1301, Calibration, Source Check, Operation and Set-up of Eberline Beta Air
 Monitor Model AMS-4, Rev. 0
 RP-TM-440-001, Sampling Breathing Air System, Rev. 1
 RP-TM-440-003, Use of Compressed Air for Supplied Air Respirators, Rev. 1
 RP-TM-440-004, Recharging of Breathing Air Cylinder Using Ingersoll-Rand Recharging
 System, Rev. 1
 RP-TM-825-001, Monthly Inspection and Maintenance of MSA Firehawk Mask Mounted
 Regulator SCBAs
 1101-21, Radiation Monitoring System Set Points, Rev. 80
 661910-OPS-4510.04, Respirator Face Piece Testing, Rev. 0
 6610-OPS-4510.03 Inspection and Maintenance of Respiratory protective Equipment, Rev. 4

Documents

Shift Staffing reports
 Air Quality testing – TQ-AA-224-F020, Level I Air Quality, Rev. 2
 Inspection Records – SCBA Packs 41, 1, 2
 TMI Operation Plant Manual, Auxiliary and Fuel Handling Building Heating and Ventilation,
 Rev. 10
 Reactor Building Cooling and Ventilation System, Rev. 9

Section 2RS04: Occupational Dose Assessment

Procedures

RP-AA-203, Exposure Control and Authorization, Rev. 3
 RP-AA-203-1001, Personnel Exposure Investigation, Rev. 6
 RP-AA-210, Dosimetry Issue, Usage and Control, Rev. 20
 RP-AA-215, Calculating and Crediting Dose from Noble Gas Exposure, Rev. 0
 RP-AA-220-1001, Collection and Handling of In-Vitro Bioassay Samples, Rev. 0
 RP-AA-270, Prenatal Radiation Exposure, Rev. 6
 RP-AA-301, Radiological Air Sampling Program, Rev. 4
 RP-AA-302, Determination of Alpha Levels and Monitoring, Rev. 4
 RP-AA-350, Personnel Contamination Monitoring Decontamination, and Reporting, Rev. 9
 RP-AA-700-1215, Calibration of Lo-Volume Air Sampler, Rev. 0
 RP-AA-700-1217, Calibration and Operation of Lapel Air Samplers, Rev. 0
 RP-AA-700-1245, Operation of Hi Volume Air Sampler, Rev. 0
 6610-ADM-4246.01, Operation, Calibration and Quality Assurance of the Canberra
 Whole Body Counting System, Rev. 8

Documents

Alpha Monitoring and Assessment – RAF-10-010
 Various dosimetry records including personnel exposure investigations
 Check-in Assessment – 1132269
 NVLAP Accreditation – 100555-0
 FASA -102872

Section 4OA2: Identification and Resolution of Problems**Procedures**

1001J.1, Surveillance Testing Program, Rev. 9
 1302-5.2, RPS High and Low RC Pressure Channels, Rev. 34
 1302-5.6, RCP Power Monitor Calibration and Pump/Flux Comparator Test, Rev. 26
 1302-5.8, High and Low Pressure Injection Analog Channels, Rev. 27
 1302-5.10, Reactor Building 4 PSIG Channel, Rev. 30
 1302-5.15A.4, CR2-LT2 Level Channel Calibration
 1302-5.17, Make-Up Tank Level & Pressure Instrumentation, Rev. 28
 1302-6, Calibration of Non-Tech Spec Instruments Used for Tech Spec Compliance, Rev. 65
 1302-16, ICCW and NSCCW Level Calibration, Rev. 19
 1303-11.39A, HSPS – EFW Auto Initiation, Rev. 41
 CC-AA-102, Design Input and Configuration Change Impact Screening, Rev. 21
 ER-AA-520, Instrument Performance Trending, Rev. 3
 IC-1, Differential Pressure Transmitter Loop Calibration, Rev. 20 IC-1
 IC-4, Thermocouple (TC) Temperature Loop Troubleshooting, Repair and Calibration, Rev. 13
 MA-AA-716-210, Performance Centered Maintenance (PCM) Process, Rev. 11
 MA-AA-716-210-1001, Performance Centered Maintenance Templates, Rev. 9

Issue Reports

0826500	0826503	1008004	1011379	1115086	1118379
1192656	1138067	1141920	1177732	1186375	1213637
1213870	1215829	1233885	1239593		

Maintenance Work Orders

R2044421	R2045324	R2045325	R2045326	R2044947	R2064330
R2066468	R2076637	R2077003	R2077467	R2078363	R2078484
R2095964	R2095989	R2100239	R2109732	R2112310	R2113169
R2113240	R2113254	R2115356	R2132116	R2138549	R2138550
R2146472					

Miscellaneous

Calculation C-1101-624-E510-009, TMI Core Flood Tank Level Calculation; Baseline Calibration and Loop Errors (CR2-LT1, 2, 3, and 4), Rev. 0
 TMI Unit 1 Technical Specification Table 3.5-1, Instruments Operating Conditions
 TMI Unit 1 Technical Specification Table 4.1-1, Instrument Surveillance Requirements
 TMI Unit 1 Procedure Change Backlog List, as of September 12, 2011

Other

ARs:	A2000928	A1726348	A1722437	A1722438	A1722439
WOs:	C1006341	C2019580	C1006341	C1106522	R1167282

Section 4OA3: Event Follow-up**Procedures**

EP-AA-1009, Exelon Nuclear Radiological Emergency Plan Annex for TMI Station, Rev. 17
 IC-214, Seismic Monitoring System Test, Rev. 2
 LS-AA-1150, Event Notifications, Rev. 0
 OP-TM-AOP-003, Earthquake, Rev. 1

Other

10 CFR 100 App.A, V(a)(2), Determination of Operating Basis Earthquake

Alarm Response Card for PRF-1-2, Threshold Seismic Condition

Alarm Response Card for PRF-1-3, Operating Basis Earthquake

NRC Event Notification #47190, dated August 23, 2011

TMI Event Summary Report for EAL Declaration, dated August 24, 2011

TMI-1 Shift Operations Logs, dated August 23, 2011

TMI-1 Seismic Instrumentation Spectra Analysis Report, dated August 23, 2011

TMI-1 OBE Criteria Evaluation, dated August 23, 2011

TMI-1 State/Local Notification Forms, dated August 23, 2011 (EP-MA-114-100-F-1, Rev. K) for
EAL declaration 'HU5' at 2:01pm.

IRs: 1266162 1255065 1255659 1254570 1257490

LIST OF ACRONYMS

ADAMS	Agencywide Documents and Management System
ALARA	As Low As Reasonably Achievable
ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
CO	Carbon Monoxide
DAC	Derived Air Concentration
DH	Decay Heat
DRP	Division of Reactor Projects
DTCS	Digital Turbine Control System
ECR	Engineering Change Request
ED	Electronic Dosimeter
EDG	Emergency Diesel Generator
EFW	Emergency Feedwater
ERO	Emergency Response Organization
ESAS	Engineered Safeguards Actuation System
FASA	Focused Area Self-Assessment
FSAR	Final Safety Analysis Report
HSPS	Heat Sink Protection System
ICS	Integrated Control System
IR	Issue Report
IST	Inservice Testing
MDA	Minimum Detectable Activity
MR	Maintenance Rule
NCV	Non-cited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NVLAP	National Voluntary Laboratory Accreditation Program
PADEP	Pennsylvania Department of Environmental Protection
PARS	Publicly Available Records
PCM	performance Centered Maintenance
PI	Performance Indicator
PMT	Post Maintenance Testing
RCE	Root Cause Evaluation
RPS	Reactor Protection System
RWP	Radiation Work Permit
SBO	Station Blackout
SCBA	Self-contained Breathing Apparatus
SDE	Shallow Dose Equivalent
SSC	Structures, Systems, and Components
TMI	Three Mile Island, Unit 1
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report