



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

April 23, 2010

Mr. Charles G. Pardee  
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 5000289/2010002

Dear Mr. Pardee:

On March 31, 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 April 13, 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.

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 610-337-5200 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 05000289/2010002  
w/Attachment: Supplemental Information

cc w/encls: Distribution via ListServ

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

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## U.S. NUCLEAR REGULATORY COMMISSION

## REGION I

Docket No: 50-289

License No: DPR-50

Report No: 05000289/2010002

Licensee: Exelon Generation Company

Facility: Three Mile Island Station, Unit 1

Location: Middletown, PA 17057

Dates: January 1 through March 31, 2010

Inspectors: D. Kern, Senior Resident Inspector  
J. Brand, Resident Inspector  
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Enclosure

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**SUMMARY OF FINDINGS**

IR 05000289/2010002; 1/1/2010-3/31/2010; Exelon Generation Company, LLC; Three Mile Island, Unit 1, Routine integrated report.

The report covered a three-month period of baseline inspection conducted by resident inspectors and announced inspections by regional 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 in the defueled mode as part of the 18<sup>th</sup> refueling outage (1R18) which began on October 26, 2009. Major work accomplished during this refueling outage included replacement of the 'A' and 'B' once-through steam generators (OTSGs), alloy 600 dissimilar weld inspection and mitigation, replacement of 'A', 'B', and 'D' 120 volt vital bus inverters, 'A' cooling water tower upgrade modification, repair of numerous cooling water system leaks due to microbiological induced corrosion, and reactor core refueling. The 90-day refueling outage was completed on January 24, 2010 and the reactor achieved 100 percent rated thermal power on January 26. On March 3, operators performed an unplanned shutdown in response to lowering 'B' reactor coolant pump upper bearing lubricating oil level. Operators returned the plant to full power on March 6, following repair of a leaking flange on the 'B' reactor cooling pump lubricating oil system cooler.

### 1. REACTOR SAFETY

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

#### 1R01 Adverse Weather Protection (71111.01)

##### .1 Seasonal Adverse Weather - Cold Weather (1 sample)

##### a. Inspection Scope

The inspectors walked down risk significant plant areas during January 25 – 29, to assess Exelon's protection for cold weather conditions. The inspectors evaluated outside instrument line conditions and the status of the heat trace system. The walkdown included the protected area perimeter, the intruder detection system, the fire protection system, B.5.b event mitigation equipment storage areas and associated transit pathways for event mitigation, and safety-related river water system components within the intake pump house. The inspectors also interviewed operators and engineers regarding measures to verify event contingency equipment (also known as B.5.b equipment) readiness during periods of extreme cold (Issue Reports [IRs] 767636, 1002213, and 1012717). The inspectors also reviewed implementation of procedures MA-TM-1003, Snow and Ice Removal Plan-TMI, Rev. 1, OP-TM-251-902, Spent Fuel Pool Spray, Rev. 3, WC-AA-107, Seasonal Readiness, Rev. 7 and OP-AA-108-111-1001, Severe Weather and Natural Disaster Guidelines, Rev. 4, for cold weather conditions.

##### b. Findings

No findings of significance were identified.

##### .2 Impending Adverse Weather – Severe Winter Storm & High Winds (2 samples)

##### a. Inspection Scope

On February 5 and 10, two severe winter storms approached TMI. The inspectors performed onsite inspection activities described below for each of the two separate storm events. Operators and work control personnel reassessed work activities to optimize equipment availability. The inspectors met with various managers to discuss the associated potential impact on offsite power availability, the river water intake pathway, emergency response organization (ERO), and plant operator/security officer relief availability in the event significant snowfall closed the roadways near TMI. Each storm brought approximately 18 inches snowfall, strong wind (gusting over 50 miles per hour), and snow drifting. Several planned maintenance activities were appropriately deferred to maximize equipment availability. The TMI staff coordinated with snow removal contractors to clear snow from critical pathways and to provide transportation for various relief operators and security personnel to ensure appropriate staffing levels were maintained. The inspectors performed station walkdowns, interviewed operators and security officers, and observed plant operations prior to, during, and after the storms to verify TMI operation was consistent with Technical Specifications (TS), the Security Plan was properly implemented, and ERO capabilities were maintained in accordance with EP-AA-1009, Radiological Emergency Plan Annex for TMI Station, Rev. 14. Documents reviewed during this inspection included IRs 1028850, 1029101, and 1029252.

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 January 18 and 19, the inspectors walked down the emergency feedwater (EFW) system and components while the plant was in cold shutdown mode following completion of procedure OP-TM-424-101, Shifting Emergency Feedwater (EFW) From Plant Shutdown To Standby Mode, Rev. 4. The inspectors also reviewed IR 1018399 which evaluated minor check valve (EF-V-12 A and B) seat leakage at low OTSG pressure;
- On January 20, the inspectors walked down portions of the 'A' and 'B' reactor building emergency cooling water systems, support systems, and associated breaker panels, while operators were controlling reactor building air temperature using the reactor building emergency cooling system per OP-TM-999-088, Interim Change IC-28681;
- On March 11, the inspectors walked down portions of the 'A' emergency diesel generator (EDG) and 'A' emergency 4KV electrical power system, while the 'B' EDG was declared inoperable to replace a leaking oil ring catcher that caused a small exhaust manifold fire on February 12 and March 11 (IRs 1029252 and 1041224); and

- On March 15, the inspectors walked down the 'A' and 'B' station air compressors, instrument air compressor 4, and various components in the system air to instrument air cross-connect flowpath, while instrument air compressors capable of being powered from vital power supplies (IA-P-1A and IA-P-1B) were inoperable.

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 January 20 thru 21, the inspectors performed one complete system walkdown sample on the 'A' and 'B' decay heat trains while the plant was operating at reduced power. 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 - 6 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. 10. Fire zones and areas inspected included:

- Fire Zone DG-FA-1, Diesel Generator Building, Diesel Generator A;
- Fire Zone DG-FA-2, Diesel Generator Building, Diesel Generator B;
- 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; and
- Fire Zone CB-FA-2G, Control Building Elevation 322', West Battery Room.

#### b. Findings

No findings of significance were identified.



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

The inspectors performed visual inspections of flood barriers, system boundaries, and water line break sources located in portions of the intermediate building where internal flooding could adversely affect safety related systems needed for safe shutdown of the plant. The inspectors walked down the EFW pump rooms and the area enveloped by a circular retaining wall surrounding the reactor containment (commonly known at TMI as the "Alligator Pit"), and interviewed the system engineer and operators. In addition, the inspectors reviewed IRs 1022372 and 1008375 which evaluated minor discrepancies that challenged the intermediate building sump and drain system.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11Q – 1 sample)a. Inspection Scope

On March 23, the inspectors observed licensed operator requalification (LOR) training at the control room simulator for the 'E' 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-S018, Earthquake, Fuel Failure, FW Loop Demand Failure, Dropped Control Rod, Dropped Control Rod Group, Anticipated Transient Without Scram, Rev. 0.

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 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 – 2 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 November 4, 2009, while the plant was shutdown for refueling outage 1R18, operators identified MU-V-16C would not close electrically from the main control room during performance of 1303-13.4, Remote Shutdown System Functional Test, Rev. 6 (IR 988733). Technicians performed troubleshooting and cleaned the associated relay. On January 6, 2010, MU-V-16C failed to close once more during post maintenance testing activities per 1303-13.4 (IR 1013368). Corrective actions included initiation of an extended trouble shooting plan and replacement of a main control room push button switch per Work Order AR-A2236726. The inspectors performed field walk downs, interviewed the system engineer and electrical maintenance supervisor, and verified this issue would not have prevented the valve function since valve closure from the remote shutdown panel was successful and the valve could have been closed locally. In addition, control room operators could have adjusted high pressure injection (HPI) flow by securing the applicable HPI pump; and
- On February 12, 2010, operators identified a small fire at the 'B' EDG (EG-Y-1B) exhaust manifold during monthly surveillance testing per 1303-4.16, Emergency Power System, Rev. 122 (IR 1029252). Operators immediately extinguished the flame after approximately 40 seconds. A normal EDG shutdown was performed. Engineers and technicians performed inspections and replaced the ring catcher gasket due to minor cracking around the gasket bolt holes. On March 10, a small fire occurred once more during a similar monthly surveillance test (IR 1041224). Technicians replaced the complete ring catcher assembly, initiated an apparent cause evaluation per IR 1041224, and successfully tested the EDG. A subsequent visual inspection of the ring catcher identified a small (1/2 inch) crack at one of many welds of the ring catcher assembly. The defective ring catcher was sent offsite for metallurgical analysis. The inspectors performed field walk downs of both EDGs, interviewed the system engineer and maintenance technicians, observed post maintenance tests, reviewed completed procedure 1303-4.16, and verified that the degraded condition would not have prevented the 'B' EDG from performing its design safety function.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 7 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 January 27, technicians implemented a troubleshooting plan to assess leakage past the main condenser turbine bypass valves (MS-V-3A/B/C/D/E/F). Online maintenance risk remained Green during this activity;
- On March 5, the 'A' makeup pump (MU-P-1A) was taken out of service for planned preventive maintenance activities. This condition elevated the online maintenance risk profile to Yellow;
- On March 9, one emergency feedwater flowpath to the 'B' steam generator was removed from service (clearance 10500050) to support maintenance including EF-V-30B positioner and converter calibration. Online maintenance risk remained Green for this activity;
- On March 10, the 'B' intermediate closed cooling water pump (IC-P-1A) was removed from service for scheduled maintenance activities. This condition elevated the online maintenance risk profile to Yellow;
- On March 10, the 'B' EDG (EG-Y-1B) was taken out of service to replace a cracked exhaust manifold ring catcher after a small fire developed during a monthly surveillance test run (IRs 1041224 and 1029252). This condition elevated the online maintenance risk profile to Yellow;
- On March 12, technicians removed instrument air compressor IA-P-1B from service due to failure to load and began repairs (Work Order A2246539). On March 15, IA-P-1A failed its capacity test, further reducing available instrument air sources until IA-P-1B was successfully returned to service on March 18. The online maintenance risk profile remained Green; and
- On March 26, a strong back jacking device was installed on the main turbine stop # 1 valve (TG-SV-1) pressure seal area to stop a steam leak that was identified on March 8 (IR 1039916). The inspectors attended pre-job briefs, performed field walkdowns, interviewed operators and engineers, and reviewed Attachment 1, Temporary Leak Repair Permit CC-AA-404, Rev. 8 (Work Order M2246155). The online maintenance risk profile remained Green during this evolution.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 – 7 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 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 January 12, operators identified that all four EFW water supply valves to the steam generators could not be opened manually (with handwheel) per surveillance procedure OP-TM-424-212, IST Of EF-V-30s and EF-V-52s, Rev. 4 (IRs 1015513, 1015523, 1015663, 1015670, and 1015675). Engineers determined that nothing was wrong with the manual valve operators and concluded the cause was an operator knowledge issue. The valves were manually operated satisfactorily on January 14. The inspectors visually inspected the valves, interviewed the system engineer and operators, and verified that operability of the valves was not affected;
- On January 21, operators identified a decreasing trend in the 'C' reactor coolant pump (RC-P-1C) lower bearing oil reservoir level (IR 1019220). The decreasing trend was noted since plant startup after the 1R18 refueling outage. The leak was estimated at 0.36 gallons per day. A similar leak was identified during the last operating cycle, along with slightly elevated motor vibration. Several corrective actions including replacement of lower bearing shoes, cleaning of clogged oil reservoir vent lines (breathers), and pump motor realignment were implemented during the outage to address these issues. In consultation with the motor vendor, Exelon initiated a complex troubleshooting plan and an adverse condition monitoring plan per IR 1022036. Engineers believed the oil was being lost via the oil guard (vapor seal) due to either an excessive clearance between the oil guard and the motor shaft, a degraded oil guard, or a deficient orientation setting or clogging of the blower nozzle for the motor oil guard. Exelon developed three temporary modifications including installation of a small blower and drain hoses to reduce the oil leakage. These modifications were installed during the March 3 forced shutdown for an unrelated oil leak on the 'B' reactor coolant pump (RCP) (RC-P-1B). The leak trend has reduced to 0.1 gallons per day. Engineers determined the oil leak does not impact operability of the 'C' RCP. In addition to continued monitoring, Exelon plans to replace the 'C' RCP motor next refueling outage 1R19. The inspectors interviewed the system engineer and operators and performed multiple field walkdowns during the post 1R18 plant startup and during the forced shutdown (IRs 1020155, 1022680, 1023888 and 1025175);
- On January 22, operators observed no indication lights were lit on the diverse scram system (DSS) cabinet. Technicians determined the light bulbs were burned out and replaced them. After replacement, the DSS enable light continued to flicker (IRs 1019649 and 1020208). Station personnel reviewed DSS schematics and concluded DSS remained operable;
- On January 23, the inspectors observed photographs of two leaks at incore instrumentation connections located just above the incore instrument seal table and reviewed IR 1018615 that documented the leakage and the related actions to evaluate the condition. Additionally, the inspectors monitored the reducing change in leak rate, reviewed the closure assembly details shown in technical document 01-5048122-00, reviewed the applicable operability evaluation, and reviewed the associated adverse condition monitoring plan "Monitoring RCS Leakage Through IM-SPND-14 and IM-SPND-16" including the established action threshold for each monitored parameter. During the March 3 shutdown, the inspectors visually inspected the incore seal table to verify the two incore leaks remained stable;

- On January 31, engineers identified that several instruments used for performance of periodic inservice testing of the 'A' decay river water pump were not calibrated within their current calibration periodicity. Engineers assessed the impact on pump operability, the extent-of-condition for the 'B' decay river water pump, and the cause of the issue (IR 1023996). Engineers concluded the 'A' decay river water pump remained operable, associated instruments were then recalibrated, and associated procedure changes were completed;
- On February 3, MU-FI-1128 became inoperable due to indicating higher than actual flow on the 'B' HPI header. Operators determined that the 'B' HPI train remained operable, provided that RCP seal injection remained aligned to the 'A' HPI train. The inspectors verified the basis for 'B' HPI train operability and verified RCP seal injection alignment from the 'A' HPI train; and
- On March 3, operators identified a decreasing trend in the 'B' RCP (RC-P-1B) upper bearing oil reservoir level (IR 1037870). The decreasing trend was noted since February 27 and was estimated at .09 gallons per hour (GPH). On March 3 an unplanned (forced) plant shutdown was initiated due to increased leakage to approximately 2.4 GPH. Troubleshooting and inspections identified a leaking oil cooler flange (2 out of 4 bolts). The flange gasket was replaced and the bolts were properly tightened. No other leaks were identified. On March 5, during plant startup, operators identified a new upper bearing oil reservoir level drop with a potential leak of 0.2 GPH. A new complex troubleshooting plan was developed (IR 1039351). Field walkdowns and inspections did not identify any new leaks and plant startup was continued to 100 percent of rated power. Engineers believe the most likely cause is a siphon effect caused by an alternate oil feed process used during the forced shutdown to expedite the oil addition process. Engineers determined the current oil leak rate does not impact operability of the 'B' RCP. In addition to continued monitoring, Exelon evaluated available actions such as a temporary modification to close a small valve in the oil reservoir loop to stop the siphon effect. The inspectors interviewed the system engineer and operators, performed field walkdowns during the forced shutdown, reviewed applicable documents, and verified appropriate mitigating actions have been taken (IRs 1039340 and 1039500).

b. Findings

No findings of significance were identified.

1R18 Plant Modifications (71111.18 – 4 samples)

a. Inspection Scope

The inspectors reviewed the following modifications to determine whether they were designed and/or implemented as required by Exelon documents CC-AA-102, Design Input and Configuration Change Impact Screening, Rev. 19 and CC-AA-103, Configuration Change Control, Rev. 20. The inspectors verified the modification supported plant operation as described in the Updated Final Safety Analysis Report (UFSAR) and complied with associated TS requirements. The inspectors reviewed the function of the changed component, the change description and scope, and the associated 10 CFR 50.59 screening evaluation.

- Engineering Change Request (ECR) TM-10-163, RC-P-1C Augmented Oil Collection System, Rev. 1, and ECR TM-10-122, RC-P-1C Lower Oil Guard Vent Line Extensions, Rev. 1, installed temporary drain hoses to direct oil leakage from the 'C' RCP (RC-P-1C) lower bearing oil reservoir into the oil collection system, to allow draining of the oil collection tank from outside the 'D' ring to reduce radiation exposure to workers due to expected increased oil addition activities, and to install a small blower to increase the back pressure in the bearing oil guard. The modifications were implemented to address a decreasing trend in the 'C' RCP lower bearing oil reservoir level (IR 1019220);
- ECR TM-10-162, RC-T-7 Drain Hose TCCP, Rev. 0, installed temporary drain hoses to allow draining of the oil collection tank for the 'B' RCP from outside the 'D' ring to reduce radiation exposure to workers due to expected increased oil addition activities. The modification was implemented to address a decreasing trend in the 'B' RCP upper bearing oil reservoir level (IR 1037870);
- ECR TM 10-00015, Temporary Modification for Cooling Reactor Building during Industrial Cooler Rework, Rev. 2, connected a portable temporary cooling tower, circulating pumps, hoses and makeup water supply in place of the normally used reactor building industrial coolers. This modification was installed to provide continued reactor building cooling while the industrial coolers were removed from service to repair damaged heat exchanger tube bundles; and
- ECR TM 10-00120, 'B' Isophase Bus Duct Supplemental Cooling, Rev. 0 installed temporary portable fans and thermocouples to provide additional cooling and monitoring capability. This modification was installed because following plant restart from T1R18, technicians identified that several bus duct jumpers had elevated temperature, up to 400 degrees Fahrenheit. This ECR effectively reduced temperatures. Corrective maintenance to the isophase bus duct jumpers was performed during the March 4-6 forced outage.

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 January 6, operators and technicians performed procedure OP-TM-211-213, IST Of MU-V-16C and MU-V-16D, Rev. 1, after replacement of MU-V-16C main control room push button switch per Work Order AR-A2236726 to address unexpected failure to close the valve from the main control room (IR 988733);
- On January 22, operators and technicians performed post maintenance testing of reactor vessel remote vent valve (RC-V-42) per procedure OP-TM-220-244, Interim

Change IC-28707, after removal and replacement of the valve internal components due to a clogged pilot orifice (IR 1017742);

- On January 24, operators and technicians performed procedure OP-TM-411-201, MS-V-1A/B/C/D Check Valve Function Test, Rev. 3, after scheduled maintenance of valve MS-V-1C during the 1R18 refueling outage;
- On February 12, technicians performed 1302-5.18, HPI/LPI Flow Channel Calibration, Rev. 34, following corrective maintenance on flow transmitter MU-FT-1128;
- On March 5, electrical technicians performed post maintenance testing of the 'B' isophase duct per procedure E-131, Isophase Bus Duct Maintenance, Rev. 7, after corrective maintenance to replace ground jumper cables due to elevated temperatures (IR 1027848);
- On March 6, operators performed procedure OP-TM-211-437, Supplying Seal Injection From MU-P-1A, Rev. 0, after repair of a small leak on a pump discharge line drain flange connection (IR-1038899); and
- On March 11, operators performed post maintenance testing of the 'B' emergency diesel generator (EG-Y-1B) per procedure 1303-4.16, Emergency Power System, Rev. 121A, after corrective maintenance to replace a cracked exhaust manifold ring catcher due to small fires that developed during two separate scheduled monthly surveillance test runs (IRs-1041224 and 1029252).

b. Findings

No findings of significance were identified.

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

.1 Refueling and Steam Generator Replacement Outage

a. Inspection Scope

At the beginning of this inspection period, TMI Unit 1 was defueled, the steam generators had been replaced, the reactor building containment construction opening liner had been reinstalled, and concrete had been poured to seal the containment construction opening through which the old steam generators had been removed. The inspectors reviewed outage and reactor startup activities to determine whether shutdown safety functions (i.e., reactor decay heat removal, reactivity control, electrical power availability, reactor coolant inventory, spent fuel cooling, and containment integrity) were properly maintained as required by TSs and TMI-2006-010, TMI-1 Outage Fuel Protection Criteria, Rev. 3. Specific attributes evaluated included configuration management, communications, instrumentation accuracy, and identification and resolution of problems. The inspectors closely evaluated configuration and inventory control during periods of reduced reactor coolant system (RCS) inventory due to the associated increase in shutdown risk. 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 activities evaluated included:

- Reviewed the T1R18 Shutdown Safety Plan to verify it properly addressed safety criteria prescribed by TMI-2006-010, TMI-1 Outage Fuel Protection Criteria, Rev. 3;
- Shutdown cooling (decay heat removal trains 'A' and 'B' operation) per OP-TM-212-111, Rev. 5 and OP-TM-212-112, Rev. 5;
- Reactor building construction opening tendon replacement and re-tensioning;
- Restoration of containment integrity;
- Fuel reload;
- New enhanced OTSG post installation testing after replacement;
- Plant heatup;
- Reactor building walkdown during plant heatup to inspect for indication of RCS leakage and boric acid corrosion;
- Plant startup and power ascension; and
- Unit Restart review, following completion of 1R18.

b. Findings

No findings of significance were identified.

2. Forced Maintenance Outage to Repair Reactor Coolant Pump (RC-P-1B) Oil Leak

a. Inspection Scope

On March 3, operators performed an unplanned reactor shutdown in response to indications of lowering 'B' RCP upper bearing lubricating oil level. Operators returned the plant to full power on March 6, following repairs of a leaking flange on the 'B' RCP lubricating oil system cooler. The inspectors reviewed shutdown and re-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;
- High temperatures on 'B' isophase bus duct grounding cables;
- Main generator - small electro hydraulic oil leaks;
- Installation of several temporary modifications 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; and
- Rod-8-7 inoperable during OP-TM-622-201 control rod movement.

b. Findings

No findings of significance were identified



1R22 Surveillance Testing (71111.22 – 8 samples)a. Inspection Scope (1 Inservice Testing [IST] Sample and 3 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 January 7, OP-TM-211-211, HPI Test, Rev. 7;
- On January 10, IST Of MS-V-2A And MS-V-2B, Rev. 1;
- On January 15-16, 1303-6.1, Reactor Building Integrated Leak Rate Test, Rev. 38, performed to meet requirements of TS and 10 CFR 50, Appendix J, Section IV;
- On January 21, OP-TM-212-211, LPI Test Of DH Train A, Rev. 8;
- On January 21, OP-TM-212-212, LPI Test Of DH Train B, Rev. 8;
- On February 8, OP-TM-826-301, Control Room Envelope Unfiltered Inleakage Testing Procedure, Interim Change IC-28762;
- On March 1, OP-TM-622-201, Control Rod Movement, Interim Change IC-28874 (IR 1036542); and
- On March 27, OP-TM-424-203, IST Of EF-P-1 And Valves, Rev. 6.

b. Findings

No findings of significance were identified.

**Cornerstone: Emergency Preparedness**1EP6 Drill Evaluation (71114.06 - 1 sample)a. Inspection Scope

The inspectors observed an emergency event training evolution conducted on March 30, at the Unit 1 control room simulator and the technical support center to evaluate emergency procedure implementation, event classification, and event notification. The event scenario involved multiple safety-related component failures and plant conditions warranting simulated Unusual Event and Site Area Emergency event declarations. 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.

#### 4. OTHER ACTIVITIES

##### 4OA1 Performance Indicator Verification (71151)

###### a. Inspection Scope

Cornerstone: Initiating Events (3 samples)

The inspectors reviewed selected station records to verify NRC Performance Indicators (PIs) had been accurately reported to the NRC as specified in NEI 99-02. The three PI samples listed below were verified for the period January to December 2009.

- Unplanned Scrams per 7000 Critical Hours
- Unplanned Scrams with Complications
- Unplanned Power Changes per 7000 Critical Hours

The inspectors reviewed operator logs, licensee event reports, monthly station operating reports, corrective action program database documents, calculation methods, definition of terms, and use of clarifying notes. The inspectors also verified accuracy of the number of reported critical hours used in the calculations.

###### b. Findings

No findings of significance were identified.

##### 4OA2 Identification and Resolution of Problems (71152)

###### a. Inspection Scope

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

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.

###### b. Findings

No findings of significance were identified.

##### 4OA5 Other Activities

###### .1 Steam Generator Replacement (IP 50001)

###### a. Inspection Scope

Following the restoration of the temporary construction access opening in the side of the exterior containment wall, an integrated leak rate test (ILRT) of the containment boundary was conducted. During this inspection, the inspectors reviewed a calculation for containment volume, reviewed the test procedure, monitored prerequisite activities

such as valve lineups, containment walkdowns, and local leak rate tests, witnessed the performance of the test, monitored system restoration activities, and reviewed the results of the test. The inspectors verified the requirements of 10 CFR 50 Appendix J were met, and the results of the Type B ILRT were acceptable.

The inspectors reviewed the planned startup testing procedure for the replacement steam generators. The inspectors reviewed the Enhanced Once-Through Steam Generator post-installation test program and Exelon documentation for the RCS pressurization leak test and walkdown during initial plant startup. The inspectors also reviewed the testing documentation used to verify that RCS flow for the new steam generators conformed to design predictions and a sample of calibration and testing procedure results for plant instrumentation affected by the steam generator replacement.

The inspectors reviewed a sample of radiographs and ultrasonic test reports of steam generator project replacement primary and secondary system welds. The involvement of the American Society of Mechanical Engineers (ASME) Code inspector in review of project work including verification of personnel qualifications, procedure adequacy, and test result conformance to the ASME Code was assessed.

b. Findings

No findings of significance were identified.

2. NRC Temporary Instruction 2515/177 - Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal and Containment Spray Systems

a. Inspection Scope

The inspectors performed this inspection in accordance with Temporary Instruction (TI) 2515/177, Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal and Containment Spray Systems, for TMI. The NRC staff developed TI 2515/177 to support the NRC's confirmatory review of licensees' response to NRC Generic Letter (GL) 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal and Containment Spray Systems." The Office of Nuclear Reactor Regulation (NRR) documented completion of their review of Exelon's GL 2008-01 response in a closure letter dated December 23, 2009 (ADAMS Accession No. ML093500241). Based on the review of Exelon's GL 2008-01 response letters, the NRR staff provided guidance on TI inspection scope to the regional inspectors. The inspectors used this specific inspection guidance along with the TI to verify that Exelon had implemented or was in the process of acceptably implementing the commitments, modifications, and programmatically controlled actions described in their GL 2008-01 response. The inspectors verified that the plant-specific information (including licensing basis documents and design characteristics) was consistent with the information used by NRR in its assessment and that it supported a conclusion that the subject systems' operability was reasonably assured.

The inspectors reviewed a sample of isometric drawings, and piping and instrument diagrams (P&IDs), and conducted selected system piping walkdowns to verify that Exelon had drawings that reflected the subject system configurations and UFSAR descriptions. Specifically, the inspectors verified the following related to the sample of isometric drawings for the HPI make-up and purification, low pressure injection (LPI)/decay heat removal, and building spray (BS) systems:

- High point vents were identified;
- High points that did not have vents were acceptably recognizable, documented in engineering drawings and evaluated for periodic ultrasonic testing (UT) measurements;
- Other areas where gas could accumulate and potentially impact subject system operability, such as at orifices in horizontal pipes, isolated branch lines, heat exchangers, improperly sloped piping, and within valve bodies, were acceptably evaluated in engineering reviews or had UT points which would reasonably detect void formation; and
- For piping segments reviewed, branch lines and fittings were clearly shown. The inspectors conducted detailed walkdowns of portions of the above systems to reasonably assure the acceptability of Exelon's drawings utilized during their review of the GL. The inspectors verified that Exelon conducted walkdowns of their HPI, LPI, BS, and core flooding (CF) systems to confirm that system orientations and vents, in combination with instructions, procedures, tests, and training, would ensure that each system was sufficiently full of water to assure operability as required. The inspectors reviewed Exelon's methodology for the determination of system piping high points, identification of negative sloped piping, and calculations of void sizes based on UT equipment readings and piping size to ensure Exelon's methods were reasonable. The inspectors reviewed engineering analyses associated with the development of acceptance criteria for as-found voids within system suction and discharge piping. The review included Exelon's engineering fourteen gates process of analysis to ensure all aspects of gas void impact on system performance had been appropriately considered. Additionally, the inspectors reviewed engineering assumptions relative to void transport and void fraction acceptance criteria developed at the inlet of the selected pumps to verify that system operability was ensured.

The inspectors reviewed a sample of Exelon's procedures used for filling and venting the associated GL systems to verify that the procedures were effective in venting or reducing voiding to acceptable levels. The inspectors verified that Exelon's specified UT surveillance frequencies were consistent with Exelon's Technical Specifications, Technical Specification bases, and the UFSAR. The inspectors reviewed a risk-informed sample of GL 2008-01 response-related UT results to verify that Exelon adequately implemented their associated procedures, appropriately documented test results, and provided reasonable assurance that the subject systems remained operable. The inspectors sampled system high point UT measurement points to ensure that the acceptance criteria had been appropriately translated from their engineering analyses.

The inspectors reviewed corrective action program documents to verify that selected actions described in Exelon's nine-month and supplemental submittals were acceptably documented including the implementation schedule for incomplete actions. The inspectors performed an independent corrective action program database search for potential gas-related issues impacting the subject systems to ensure that Exelon appropriately evaluated and adequately addressed gas-voiding concerns. Additionally, the inspectors reviewed Exelon's evaluations and corrective actions for post fill and vent

UT gas detection to ensure appropriate evaluation of operability was performed. The inspectors sampled Exelon's training documents, specifically with respect to operations training, to assess if appropriate training had been provided to the operations staff to ensure appropriate awareness of the effects of gas voiding. The inspectors also discussed gas-voiding concerns with design and system engineers to assess their awareness of gas voiding issues and the potential impacts, as well as the effectiveness of Exelon's training. Documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

40A6 Meetings, Including Exit

Exit Meeting Summary

On April 13, 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.

ATTACHMENT: SUPPLEMENTAL INFORMATION

**SUPPLEMENTAL INFORMATION**  
**KEY POINTS OF CONTACT**

Licensee Personnel

D. Atherholt	Manager, Regulatory Assurance
R. Atkinson	Manager, Steam Generator Replacement Project
C. Baker	Manager, Chemistry
R. Bleistine	Normandeau Associates
K. Boring	NSSS Engineering Manager
T. Bradley	Normandeau Associates
J. Byrne	Licensing
G. Chevalier	Senior Chemist
R. Davis	Manager, Radiation Protection
D. DeBoer	Director, Operations
D. DiVitore	Manager, Radiological Engineering
T. Dougherty	Plant Manager
D. Etheridge	Manager, Radiation Protection Technical Support
T. Geyer	Engineering
J. Heischman	Director, Maintenance
J. Karkoska	Manager, Site Security
R. Libra	Director, Work Management
F. Linsenbach	Manager, OTSG Replacement Radiation Protection
W. McSorley	Mechanical Design Engineer
A. Miller	Regulatory Assurance
J. Murray	Manager, Operations Training
D. Neff	Manager, Emergency Preparedness
W. Noll	Site Vice President
J. Piazza	Senior Manager, Engineering
M. Reed	Systems Engineering
T. Roberts	Supervisor, Radiation Protection
J. Schork	Lead LORT Instructor
A. Seedarson	Systems Engineering
B. Swenson	VP Projects
M. Sweigart	Supervisor, Radwaste/Environmental
W. Taylor	Project Manager (concrete), SGT
D. Trostle	Operations Security Analyst
L. Weber	Senior Chemist
L. Weir	Manager, Nuclear Oversight Services
C. Wend	Manager, Radiation Protection
V. Zeppos	Design Engineering

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

None

## LIST OF DOCUMENTS REVIEWED

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

#### Drawings

302-640, Decay Heat Removal, Rev. 82

302-641, Decay Heat Removal, Rev. 6

302-645, Decay Heat, Rev. 39

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

#### Procedures

EP-AA-112-100-F-01, Shift Emergency Director Checklist, Rev. 1

EP-AA-1000, Exelon Nuclear – Standardized Radiological Emergency Plan, Rev. 19

EP-AA-1009, Radiological Emergency Plan Annex for the Three Mile Island (TMI) Station,  
Rev. 13

OP-TM-AOP-003, Earthquake, Rev. 0

OP-TM-AOP-062, Inoperable Control Rod, Rev. 2

OP-TM-AOP-70, Primary to Secondary Heat Transfer Upset, Rev. 2

OP-TM-EOP-001, Reactor Trip, Rev. 10

OP-TM-EOP-010, Emergency Procedure Rules, Guides, and Graphs, Rev. 11

OP-TM-MAP-C0101, Radiation Level Hi, Rev. 1

### **Section 1R015: Operability Evaluations**

#### Procedures

OP-TM-211-000, Makeup and Purification System, Rev. 19A, Interim Change 28596

OP-TM-211-901, Emergency Injection (HPI/LPI), Rev. 5

OP-TM-EOP-010, Emergency Procedure Rules, Guides, and Graphs – Rule 2, Rev. 11

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

1302-5.18, HPI/LPI Flow Channel Calibration, Rev. 34a

#### Drawings

302-661, Make-up and Purification, Rev. 59

#### Other

Work Orders A2242605, A2242678, and A22422768

### **Section 1R19: Post Maintenance Testing**

#### Procedures

E-131, Isophase Bus Duct Maintenance, Rev. 7

MA-AA-716-1003, Thermography Program Guide, Rev. 3

Other

ACMP, Isolated Phase Bus Duct 'B' Phase Elevated Electrical Jumper Temperatures, 2/16/10  
 Issue Reports 1027848, 1032012, 1032120, 1032077, 1032423, and 1033717  
 Work Orders R2116448 and C2023019

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

1101-3, Containment Integrity and Access Limits, Rev. 87  
 1102-1, Plant Heatup to 525 F, Rev. 168  
 1102-2, Plant Startup, Rev. 149  
 1102-4, Power Operation, Rev. 117  
 1103-11, RCS Water Level Control, Rev. 67  
 1505-1, Fuel and Control Component Shuffles, Rev. 50  
 1507-3, Main Fuel Handling Bridge Operating Instructions, Rev. 26  
 MA-AA-716-008-1008, Reactor Services Refuel Floor FME Plan, Rev. 4  
 OP-AA-108-108, Unit Restart Review, Rev. 9  
 OP-TM-108-108-1008, TMI-1 Supplement to OP-AA-108-108, Rev. 9  
 OU-AP-4001, PWR Fuel Handling Practices, Rev. 4

**Section 40A5**Procedures

ER-AA-2009, Managing Gas Accumulation, Rev. 1  
 OP-AA-106-101-1006, Operational and Technical Decision Making Process, Rev. 7  
 OP-AA-108-111, Adverse Condition Monitoring and Contingency Plan for Incore  
 Instrumentations IM-SPND-14 and IM-SPND-46, Rev. 6  
 OP-TM-211-271, Fill and Vent MU Pumps, Rev. 3A  
 OP-TM-214-281, Venting BS Train A, Rev. 2  
 OP-TM-212-253, Venting DH Train A in DHR Standby Mode, Rev. 7  
 OP-TM-212-254, Venting DH Train B in DHR Standby Mode, Rev. 8  
 OP-TM-212-255, Venting DH Train A in ES Standby Mode, Rev. 5  
 OP-TM-212-257, Venting DH Train B in ES Standby Mode, Rev. 3  
 OP-TM-213-463, Raising CF-T-1A Level and/or Boron Concentration, Rev. 3  
 OP-TM-213-473, Raising CF-T-1A Nitrogen Pressure, Rev. 2  
 OP-TM-212-553, Vent of DH-P-1A, Rev. 2  
 OP-TM-212-554, Vent of DH-P-1B, Rev. 2  
 OP-TM-212-555, Fill and Vent of DHR Train A/BS Train A Using SFP, Rev. 4  
 PM213447, Void Inspection of BS-A, DH-A and DC-A Trains, Rev. 0  
 PM213449, Void Inspection of BS-B, DH-B and DC-B Trains, Rev. 0  
 1303-6.1, Reactor Building Integrated Leak Rate Test, Rev. 38

Drawings

302-640, Decay Heat Removal Flow Diagram, Rev. 82  
 302-661, Make-Up & Purification Flow Diagram, Rev. 59  
 302-711, Core Flooding Flow Diagram, Rev. 28  
 302-712, Reactor Building Spray Flow Diagram, Rev. 49  
 1D-ISI-MU-031, MU System High Pressure Injection From Penetrations 321, 322, 323, Rev. 1  
 1D-ISI-MU-033, MU System High Pressure Injection to B Loop, Rev. 1  
 1D-ISI-MU-034, MU System High Pressure Injection to A Loop, Rev. 1  
 1D-ISI-MU-035, Make Up Pump Suction, Rev. 1  
 1D-ISI-MU-038, Make Up Pump Discharge, Rev. 0  
 1D-ISI-MU-040, High Pressure Injection to Reactor Coolant Loop A, Rev. 1



1D-ISI-MU-041, High Pressure Injection to Reactor Coolant Loop B, Rev. 1  
 SK-BS-001, Reactor Building Spray BS-T-2 Composite Piping Isometric, Rev. 0  
 SK-BS-002, Reactor Building Spray BS-P1A/B Suction Piping Isometric, Rev. 0  
 SK-DH-A-001, Decay Heat "A" Train Piping Isometric, Rev. 0  
 SK-DH-B-001, Decay Heat "B" Train Piping Isometric, Rev. 0

#### Engineering Evaluations

ACIT 475218-04, Safety Injection Systems Air Entrainment Review, Rev. 1  
 ACIT 728092-76, TMI System Evaluations for NRC GL 2008-01, Rev. 0  
 C-1101-212-5310-050, TMI-1 BWST Vortex Determination, Rev. 2A  
 TM 09-00241, Technical Evaluation Addressing Air Voids "14 Gates", Rev. 1

#### Issue Reports

475218	763395	877131	1046877*
484226	818069	884860	1047687*
621660	826250	893204	1018615
666629	826265	1011499	1046877*
667790	866781	1018804	
728092	866794	1046604	

\* IR generated as a result of inspection

#### Other

ECR 06-00338, Install Air Vents B Train DH Vault (DH-V-183B/186B/188B/189B & BS-V-86),  
 Rev. 2

475218, Both Trains of HPI Operability Review Root Cause Report, dated 05/17/06

ALION-007595-001, Post-LOCA Void Fraction Downstream of the TMI-1 Containment Sump  
 Strainer, Rev. 0

Core Flood Trend Data, dated 01/01/08 to 03/06/10

Flowserve Memo Regarding Acceptable Air Entrainment for Pumps, dated 05/04/06

Furmanite Various .75 inch Hot Taps on 25 psig Borated Water System Procedure, Rev. 1

NDE Data Report 2010-002-001, Make Up System Air Void Exams 2010, dated 01/02/10

NDE Data Report 2010-002-002, Make Up System Air Void Exams 2010, dated 01/06/10

NDE Data Report 2010-002-003, Make Up System Air Void Exams 2010, dated 01/07/10

NDE Data Report 2010-002-004, HPI Reactor Bldg Air Void Exams 2010, dated 01/07/10

NDE Data Report 2010-002-005, A Decay Heat Air Void Exams 2010, dated 01/10/10

NDE Data Report 2010-002-006, B Decay Heat Air Void Exams 2010, dated 01/11/10

NDE Data Report 2010-002-007, HPI Reactor Bldg Air Void Exams 2010, dated 01/12/10

NDE Data Report 2010-002-008, A Building Decay Heat Air Void Exams 2010, dated 01/19/10

NDE Data Report 2010-002-009, B Building Decay Heat Air Void Exams 2010, dated 01/19/10

NDE Data Report 2010-002-010, Make Up System Air Void Exams 2010, dated 03/06/10

NRC Generic Letter 2008-01: Managing Gas Accumulation in Emergency Core Cooling, Decay  
 Heat Removal and Containment Spray Systems, dated 1/11/08

NRC Information Notice 94-36: Undetected Accumulation of Gas in Reactor Coolant System,  
 dated 5/24/94

## LIST OF ACRONYMS

ADAMS	Agencywide Documents and Management System
ASME	American Society of Mechanical Engineers
BS	Building Spray
CF	Core Flooding
CFR	Code of Federal Regulations
DRP	Division of Reactor Projects
DSS	Diverse Scram System
ECR	Engineering Change Request
EDG	Emergency Diesel Generator
EFW	Emergency Feedwater
ERO	Emergency Response Organization
GL	Generic Letter
GPH	Gallons Per Hour
HPI	High Pressure Injection
ILRT	Integrated Leak Rate Test
IMC	Inspection Manual Chapter
IR	Issue Report
IST	Inservice Testing
LOR	Licensed Operator Requalification
LPI	Low Pressure Injection
MR	Maintenance Rule
NCV	Non-cited Violation
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
OTSG	Once Through Steam Generator
PADEP	Pennsylvania Department of Environmental Protection
PARS	Publicly Available Records
PI	Performance Indicator
P&IDs	Piping and Instrument Diagrams
PMT	Post-Maintenance Test
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
SSC	Structures, Systems, and Components
TI	Temporary Instruction
TMI	Three Mile Island, Unit 1
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
UT	Ultrasonic Testing
1R18	18 <sup>th</sup> Refueling Outage