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

May 13, 2009

EA-09-011

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 5000289/2009002 - EXERCISE OF ENFORCEMENT DISCRETION

Dear Mr. Pardee:

On March 31, 2009, 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 April 16, 2009, 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.

This report documents one NRC-identified finding of very low safety significance (Green). The finding was determined to involve a violation of NRC requirements. However, because of the very low safety significance of the violation and because it is entered into your corrective action program, the NRC is treating this violation as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest this non-cited violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Three Mile Island.

In addition, the NRC reviewed Licensee Event Report 50-289/2008-001, which described the circumstances associated with a failed electrical relay which caused decay heat river water pump DR-P-1B to be inoperable for a period of 19 days in early 2008. This period exceeded the allowed outage time of 72 hours detailed in Technical Specification (TS) 3.3.2, and therefore is a violation of TS. Regional staff performed a risk evaluation and determined the issue was of low to moderate safety significance.

Although this issue constitutes a violation of NRC requirements, the NRC determined that the relay failure which caused DR-P-1B to be inoperable was not within Exelon's ability to reasonably foresee and correct and as a result, the NRC did not identify a performance deficiency associated with this condition. The NRC's assessment considered: (1) the scope of inspections, maintenance, and testing performed on the relay was appropriate; (2) the relay failure mechanism would not be reasonably detected or avoided through the Exelon quality assurance program or other related control measures; (3) operating experience information available to Exelon did not identify the potential for the relay problem that was experienced; (4) the relay failure was not the result of a performance deficiency on the part of Exelon staff; and (5) Exelon implemented timely and effective corrective actions to prevent recurrence of the issue. Based on the results of the NRC's inspection and assessment, I have been authorized, after consultation with the Director, Office of Enforcement and the Regional Administrator, Region I, to exercise enforcement discretion in accordance with Section VII.B.6 of the Enforcement Policy and refrain from issuing enforcement for this violation (EA-09-011).

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 Dr. Ronald Bellamy of my staff at 610-337-5200 if you have any questions regarding this letter.

Sincerely,

/RA by James W. Clifford Acting For/

David C. Lew, Director
Division of Reactor Projects

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

Enclosure: Inspection Report 05000289/2009002
w/Attachment: Supplemental Information

cc w/encl:
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M. Pacilio, Chief Operating Officer, Exelon Nuclear
W. Noll, Site Vice President, TMI Unit 1, Exelon Nuclear
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R. Janati, Director, Bureau of Radiation Protection, State of PA
D. Allard, Director, PA DEP
J. Johnsrud, National Energy Committee
E. Epstein, TMI-Alert (TMIA)

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(EA-09-011).

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/RA by James W. Clifford Acting For/
David C. Lew, Director
Division of Reactor Projects

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No:	05000289
License No:	DPR-50
Report No:	05000289/2009002
Licensee:	Exelon Generation Company, LLC (Exelon)
Facility:	Three Mile Island Station, Unit 1
Location:	P. O. Box 480 Middletown, PA 17057
Dates:	January 1 – March 31, 2009
Inspectors:	D. Kern, Senior Resident Inspector J. Brand, Resident Inspector C. Newport, Project Engineer J. Caruso, Senior Operations Engineer/Examiner P. Presby, Operations Engineer
Approved by:	Ronald R. Bellamy, Branch Chief Region I

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SUMMARY OF FINDINGS

IR 05000289/2009002; 1/1/2009 - 3/31/2009; Exelon Generation Company, LLC; Three Mile Island, Unit 1; Post-Maintenance Testing.

The report covered a 13-week period of inspection by resident inspectors and announced inspections by regional inspectors. One finding, which was a non-cited violation (NCV) was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, Significance Determination Process (SDP). Findings for which the SDP does not apply may be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, Reactor Oversight Process, Rev. 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Barrier Integrity

Green. The inspectors identified an NCV of Technical Specification 6.8.5 which requires the Reactor Building Leak Rate Testing Program to be properly implemented. Specifically, station personnel repeatedly used temperature instruments that did not meet accuracy and repeatability requirements when performing containment penetration leak rate testing (LRT). Additionally, in some cases, station personnel did not document what temperature instruments were used and therefore the test results did not adequately demonstrate that LRT test requirements had been met. Upon discovery, engineers performed a bounding engineering analysis which verified the containment barrier remained operable and entered the issue into the corrective action program (IR 892386).

This finding is more than minor because the issue is associated with the barrier performance reliability attribute of the Barrier Integrity cornerstone and adversely affected the associated cornerstone objective to provide reasonable assurance that the physical containment barrier protects the public from radionuclide releases. Repeated failure to ensure test instruments met procedure and regulatory requirements was programmatic, affected multiple components, adversely affected LRT test accuracy, and consequently impacted the licensee's ability to verify the reactor building containment barrier remained operable. The finding was of very low safety significance because the finding did not represent an actual open pathway in the physical integrity of the containment barrier and did not result in a loss of containment barrier operability. This finding had a cross-cutting aspect in the area of Human Performance, Work Practices component because station personnel repeatedly did not properly implement procedure requirements to verify material and special prerequisites for instrument accuracy and repeatability were met prior to performing containment penetration LRT [H.4(b)]. (Section 1R19)

B. Licensee Identified Violations

None.

REPORT DETAILS

Summary of Plant Status

Three Mile Island, Unit 1 (TMI) operated at approximately 100 percent rated thermal power for the entire inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 2 site samples)

.1 Impending Adverse Weather – Severe Storms & High Winds (1 sample)

a. Inspection Scope

On February 11, the National Weather Service issued a high wind watch, which subsequently escalated to a severe weather alert. Sustained winds of over 40 miles per hour (mph) and gusts over 60 mph were predicted. Station personnel implemented procedure OP-TM-AOP-004, Tornado/High Winds, Rev. 0. High winds increase the likelihood of losing offsite power and therefore inherently increase plant risk. The outage control center was staffed to coordinate ongoing planned maintenance on the 'B' decay heat river water strainer (DR-S-1B). Portions of this work involved elevated plant maintenance risk. Operators and work control personnel reassessed work activities to expedite restoration of DR-S-1B and manage overall maintenance risk. Several planned maintenance activities which included testing emergency electrical power sources, opening large protective doors to the outdoors, and heavy load lifts were appropriately deferred. The inspectors performed station walkdowns, interviewed operators, and observed plant operations during the severe weather alert to verify operators were properly implementing OP-TM-AOP-004. On February 13, winds subsided and the National Weather Service cancelled the high wind watch and severe weather alert. Operators performed post event plant walkdowns to verify the heavy winds had not adversely impacted the plant including the electrical switchyard.

b. Findings

No findings of significance were identified.

.2 Preparation and Implementation of Seasonal Readiness for Cold Weather (1 sample)

a. Inspection Scope

The inspectors walked down risk significant plant areas for several days in January to assess Exelon's protection for cold weather conditions. The inspectors were sensitive to outside instrument line conditions and the potential for freezing in areas with unheated ventilation systems. The inspectors evaluated the status of the heat trace system, and reviewed implementation of procedure WC-AA-107, Seasonal Readiness, Rev. 6 and OP-AA-108-111-1001, Severe Weather and Natural Disaster Guidelines, Rev. 3 for cold weather conditions. The walkdown included the building spray and decay heat vaults,

the heat exchanger vault, the turbine building, the auxiliary transformers, and the safety-related river water system components located within the intake structure. Other documents reviewed for this inspection included:

- Issue Report (IR) 872141, Auxiliary Building Elevation 281' Temperature <61 Degrees;
- IR 870972, 1A Station Battery Room Temperature Low;
- IR 851349, Some Winter Readiness Work not Completed by 12/1/08; and
- TMI CAP No. T2000-0967, Auxiliary Building Basement Temperatures are Considerably Less than 60 Degrees.

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 13, the inspectors walked down portions of the 'A' decay heat system, its support systems, and its associated safeguards and breaker panels, while the 'B' decay heat pump was inoperable due to scheduled maintenance;

- On January 15, the inspectors walked down portions of the 'A' reactor building spray system, its support systems, and its associated safeguards and breaker panels. This inspection was performed during and after scheduled maintenance activities which made the 'B' reactor building spray and 'B' decay heat pumps inoperable due to scheduled maintenance;

- On January 27, the inspectors walked down portions of the 'A' emergency diesel generator (EDG) and 'A' emergency 4KV electrical power system. This inspection was performed prior to and during maintenance activities (see Section 1R18) which required the 'B' EDG to be inoperable; and

- On February 10-11, the inspectors walked down portions of the 'A' decay closed cooling water and 'A' decay river water (DR) systems during a planned 'B' decay heat removal train maintenance outage.

The partial system walkdowns were conducted on the redundant and standby equipment to ensure that trains and equipment relied on to remain operable for accident mitigation were properly aligned. Additional documents reviewed are listed in the attachment.

Complete System Walkdown (71111.04S – 1 sample)

On February 24, the inspectors performed one complete system walkdown sample on the 'A' and 'B' makeup pumps and the 'A' and 'B' decay heat and reactor building spray vaults. This inspection was performed during and after maintenance activities which

required the 'C' makeup pump inoperable due to scheduled maintenance. The inspectors conducted a detailed review of the alignment and condition of the system using piping and information diagrams and evaluated the corrective action program reports for impact on system operation. In addition, the inspectors reviewed the applicable tagging and clearance (09500081), the associated protected equipment log, and interviewed the system engineer and control room operators. Additional documents reviewed are listed in the attachment.

a. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

Area Walkdowns (71111.05Q – 8 samples)

a. Inspection Scope

The inspectors conducted fire protection inspections for several plant fire zones, which were 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 being properly controlled per surveillance procedure 1038, Administrative Controls - Fire Protection Program, Rev. 72. 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 AB-FA-1, Auxiliary Building Elevation 261', Decay Heat Removal Pit 'A';
- Fire Zone AB-FA-2, Auxiliary Building Elevation 261', Decay Heat Removal Pit 'B';
- Fire Zone AB-FZ-1, Auxiliary Building Elevation 271', Heat Exchanger Vault including compensatory actions and repair of emergency light EL-L-100 (IR 876051);
- Fire Zone AB-FZ-3, Auxiliary Building Elevation 281', Makeup Valve Alley;
- Fire Zone AB-FZ-5, Auxiliary Building Elevation 281', Makeup Tank Room;
- Fire Zone AB-FZ-7, Auxiliary Building Elevation 305', Decay Heat Removal & Nuclear Services Closed Cycle Cooling Pump Area;
- Fire Zone DG-FA-2, Diesel Generator 'B' Building Area; and
- Fire Zone IB-FZ-3, Intermediate Building Elevation 295', Motor Driven Emergency Feedwater (EFW) Pump Area.

b. Findings

No findings of significance were identified.

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

.1 Quarterly Licensed Operator Requalification Program

a. Inspection Scope

On February 3, the inspectors observed licensed operator requalification (LOR) training at the control room simulator for the 'A' operator crew. The inspectors observed the operators' simulator drill performance and compared it to the criteria listed in TMI Operational Simulator Scenario TQ-TM-106-LRU-S00, Rev. 0. On March 3, the inspectors observed licensed operator requalification 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 LOR Operational Simulator Scenario 2.

The inspectors reviewed the operators' ability to correctly respond to the simulator training scenario and implement the emergency plan. Supervisory oversight, command and control, communication practices, and crew assignments were observed to ensure they were consistent with normal control room activities. Operator response was also observed during the simulator drill transients. The inspectors evaluated training instructor effectiveness in recognizing and correcting individual and operating crew errors and attended the post-drill critique in order to evaluate the effectiveness of problem identification. The inspectors verified that emergency plan classification and notification training opportunities were tracked and evaluated for success in accordance with criteria established in Nuclear Energy Institute (NEI) 99-02, Regulatory Assessment Performance Indicator Guideline, Rev. 5. Additional documents reviewed are listed in the attachment.

.2 Assessment of the 2009 Annual Operating Exam Results

a. Inspection Scope

Inspection activities were performed using NUREG-1021, Rev. 9, Supplement 1, Operator Licensing Examination Standards for Power Reactors; Inspection Procedure Attachment 71111.11, Licensed Operator Requalification Program; NRC Manual Chapter 0609, Appendix I, Operator Requalification Human Performance SDP; and 10 CFR 55.46, Simulator Rule as acceptance criteria.

A review was conducted of recent operating history documentation found in inspection reports, licensee event reports, the licensee's corrective action program, and the most recent NRC plant issues matrix. The inspectors also reviewed specific events from the licensee's corrective action program which indicated possible training deficiencies, to verify that they had been addressed appropriately. The senior resident inspector was also consulted for insights regarding licensed operators' performance. These reviews did not detect any operational events that were indicative of possible training deficiencies. Additional documents reviewed are listed in the Attachment.

The inspectors reviewed three sets of 2009 comprehensive biennial written exams, and three sets of scenarios and job performance measures (JPMs) administered during this current exam cycle (i.e., weeks 1, 2, and 3) to ensure the quality of these exams met the criteria established in the Examination Standards and 10 CFR 55.59.

The week of the inspection, the inspectors observed the administration of operating examinations to one operating crew. The operating examinations consisted of two simulator scenarios and one set of five JPMs administered to each individual.

Conformance with operator license conditions was verified by reviewing the following records:

- Six medical records. All records were complete, restrictions noted by the doctor were reflected on the individual's license, and exams were given within 24 months;

- Proficiency watch-standing and reactivation records. A sample of two licensed operator reactivation records and a sample of four quarters of non-shift licensed personnel watch-standing documentation were reviewed to ensure time on shift was current and conformed with the requirements of 10 CFR 55; and

- Remediation training records for thirteen licensed operators were reviewed for the past two-year training cycle.

Licensee's Feedback System

The inspectors interviewed instructors, training and operations management personnel, and reviewed feedback records to ensure the requalification program was meeting the needs of the operators and responsive to their noted deficiencies and recommended changes.

Conformance with Simulator Requirements Specified in 10 CFR 55.46

For the site specific simulator, the inspectors observed simulator performance during the conduct of the examinations, and reviewed discrepancy reports to verify compliance with the requirements of 10 CFR 55.46. The inspectors reviewed a sample of simulator tests including transients, steady state operations, core performance tests, and malfunction tests. The inspectors verified that a sample of completed simulator discrepancy reports and issue reports from the past two-year period effectively addressed each issue. A listing of the specific simulator tests reviewed are listed in the Attachment.

Review of Pass/Fail Rates for Written and Operating Current Exam Cycle for SDP Input

On March 30, the inspectors conducted an in-office review of licensee requalification exam results. These results included the annual operating tests and comprehensive written exams. The inspection assessed whether pass rates were consistent with the guidance of NRC Manual Chapter 0609, Appendix I, Operator Requalification Human Performance Significance Determination Process. The inspectors verified that:

*Unit 1

- Crew failure rate on the dynamic simulator was less than 20%. (Failure rate was 0.0%);

- Individual failure rate on the dynamic simulator test was less than or equal to 20%. (Failure rate was 0.0%);

- Individual failure rate on the walkthrough test (JPMs) was less than or equal to 20%. (Failure rate was 2.1%);

- Individual failure rate on the comprehensive biennial written exam was less than or equal to 20%. (Failure rate was 0.0%); and

- More than 75% of the individuals passed all portions of the exam (97.9% of the individuals passed all portions of the exam).

*Note: These results do not include two currently licensed operators who are on medical leave and were not available to take their annual operating and biennial written exams at this time. These individuals are currently restricted from license duties and will not be permitted to resume license duties until they complete all missed training and pass both their annual operating and biennial written exams (IR 875589).

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. 6. 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.

- IRs 567370, 704374, 704832, 739152, 745716, and 778856 describe multiple overload trips of the reactor building emergency ventilation fans (AH-E-1A, 1B, and 1C) while operating in high speed during surveillance testing. The inspectors also interviewed the system engineer, and reviewed IR 762090 which documented that fan AH-E-1A had exceeded the maintenance rule unavailability time limit (321 hours over a 2 year rolling period). The inspectors also reviewed the associated action plan, monitoring goal setting per 10 CFR 50.65 (a)(1), and the corrective actions implemented or planned to address this issue; and

- IRs 848086, 848780, 877358, 889776, and 89150 describe multiple failures of the reactor building containment sump radiation monitor RM-G-21 due to aging and equipment obsolescence. The inspectors verified that the applicable back-up radiation monitor (RM-L-1) remained operational and that the system maintenance rule function was not lost.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 7 samples)

a. Inspection Scope

The inspectors reviewed the scheduling, control, and 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. 7 and WC-AA-101, On-Line Work Control Process, Rev. 15.

- On January 13, the 'B' decay heat removal (DH) and building spray systems were removed from service for scheduled maintenance activities. The condition elevated the online maintenance risk profile to Orange;

- On February 5, operators deenergized 120 volt ac vital bus 'B' (VBB) as part of a planned evolution to transfer VBB from the 'B' 120 volt inverter to the 'E' inverter. The 'B' inverter was being secured for corrective maintenance. During this evolution, the power supply for engineered safeguards actuation system (ESAS) indications in the control room failed (IR 876505). Operators implemented appropriate configuration management and risk management actions during troubleshooting (work order A2216617) to assess plant conditions and restore normal ESAS indications;

- On February 10, operators removed decay river water strainer DR-S-1B from service to reinstall the strainer basket within the motorized strainer on the pump discharge line. This made the 'B' DH train unavailable and elevated online maintenance risk to Orange. Unexpected difficulties, including strainer mechanical binding and bearing alignment issues extended the planned outage from 21 to 38 hours (IR 879698);

- On February 11, the National Weather Service issued a high wind watch, which subsequently escalated to a severe weather alert (see section 1R01). Maintenance risk was already Orange due to the DR-S-1B outage. Work was coordinated to expedite restoration of the 'B' DH train. Maintenance risk then transitioned to Yellow, due to the elevated likelihood of a plant transient and loss of offsite power incumbent with severe weather. Work coordinators reassessed risk and deferred several other scheduled activities (e.g. planned removal of fuel building missile shield doors, heavy load lifts in the fuel building, and 'B' EDG periodic testing) to manage overall maintenance risk;

- On February 24, makeup pump MU-P-1C was removed from service for a scheduled outage. The condition elevated the online maintenance risk profile to Yellow;

- On February 25, the reactor building emergency cooling reactor river water flow valve (RR-V-5) was removed from service for scheduled preventive maintenance. Additional safety related equipment out of service at this time included MU-P-1C, reactor building cooling fan AH-E-1C, the 'A' vital inverter, and the 'B' vital inverter. The online maintenance risk profile was Yellow; and

- On March 14-16, station personnel identified leakage through a weld between MU-V-1034 and high pressure injection (HPI) flow transmitter MU-FT-1127 (see section 4OA3.2). Operators declared the 'A' HPI train inoperable and isolated the affected train while leak repairs and post maintenance tests were performed. This

configuration elevated online maintenance risk to Orange. Protected equipment was identified in work order C2020806.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 – 4 samples)

a. Inspection Scope

The inspectors verified that 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 Resolution of Degraded or Nonconforming Conditions Adverse to Quality, Safety and Exelon Procedure OP-AA-108-115, Operability Determinations, Rev. 8, and the plant's license and technical specifications to determine the acceptability of the operability evaluations. The inspectors reviewed operability evaluations for the following degraded equipment issues:

- Engineers identified a design deficiency in the 'B' EDG room ventilation system (IR 855285, 855784, 858216). The deficiency would cause the EDG ventilation system to operate in a recirculation mode (in lieu of using supply air from outside) if a loss of offsite power occurred while outside temperature was >75 degrees Fahrenheit (F). The room could potentially heat up beyond the 120 F design temperature within the first few hours of EDG operation. On December 17, 2008, operators became aware of the issue and implemented an adverse condition monitoring plan. Engineers determined the EDG remained operable based upon the availability of abnormal operating procedures which operators could use to restore an alternate room ventilation path before room temperatures reached the design limit.

- On March 4, auxiliary operators identified increasing motor vibration trends for the 'A' reactor river water pump (RR-P-1A) during scheduled in-service testing (IR 881948, 888589, and 889165). The vibration reached the administrative alert value but was well below the actual in-service test fault level. No other abnormal conditions were identified. Engineers determined the increasing vibration trend did not impact pump operability. Corrective actions included increased monitoring by changing the testing frequency from 92 days to 46 days, and performing an evaluation to balance the motor or to replace the pump.

- On March 16, operators identified that four engineered safeguards and actuation system (ESAS) relays did not energize picked up during the reset portion of a scheduled surveillance testing per procedure 1303-4.11, HPI/LPI Logic and Analog Channel Test, Rev. 56 (IR 867672). The cause was undetermined since engineers and technicians were not able to reproduce the condition. However, troubleshooting determined the condition involved the sensing circuit and not the relays; therefore, operability of associated components was not affected.

- On March 21, operators identified nuclear river water valve NR-V-4A did not show proper indication during scheduled ESAS testing per 1303-5.2A, 'A' Emergency Loading Sequence and HPI Logic Channel/Component Test, Rev. 5. Engineering evaluation and trouble shooting (IR 895846 and 895905) identified a sluggish relay 63Z2A/RC2A dropout (partial hung-up). The evaluation concluded that operability of the relay was not impacted. Corrective actions included relay magnet kit and coil replacement.

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. 17 and CC-AA-103, Configuration Change Control, Rev. 19. 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-08-607, Install New AH-E-1A/B/C Starters and Components, Rev. 1 was implemented as a permanent modification to address inadvertent fan trips due to equipment aging;

- ECR TM-09-00039, AH-E-29B Heating and Ventilation Control Loop, Rev. 0 was implemented as a permanent modification to correct a long-standing design error which had affected 'B' EDG operability (see Section 1R15). This modification removed a ventilation flow control interlock which had a non-safety related power supply. ECR TM-09-00039 was installed and tested in accordance with work order C2020115;

- On February 10, station personnel attempted to install a permanent plant modification to decay river water strainer DR-S-1B to address biological fouling of the strainer. During installation, mechanics identified unanticipated mechanical binding of the strainer rotating element. Station personnel appropriately backed out of the planned design change and reinstalled a temporary modification using ECR 06-00371, DRS-S-1B, Remove Internals TSSP, Rev. 0; and

- ECR TM-06-00438, Replace CF1-PT-2 & DF1-PT-4 with Digital Transmitters, Rev. 2 was implemented as a permanent modification to improve core flood tank pressure transmitter reliability. The previous transmitters had become obsolete and were experiencing increased instrument drift. The modification replaced the transmitters, power supplies, and associated protective fuses.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed and/or observed the following post-maintenance test (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. Additional documents reviewed are listed in the attachment.

- On January 7, operators performed OP-TM-214-202, In-Service Testing (IST) of BS-P-1B and Valves, Rev. 9 and established new inservice test reference values following maintenance on BS-P-1B;

- On January 14, operators performed procedure OP-TM-212-202, IST of DH-P-1B and Valves from ES Standby Mode, Rev. 8, following preventive maintenance activities on the 'B' decay heat train;

- On February 3, operators and maintenance technicians performed functional test procedure FTP 733.03, Install New AH-E-1A Starter and Components, following implementation of a permanent modification to address inadvertent fan trips due to equipment aging (ECR 08-607);

- On February 6, operators performed OP-TM-823-251, Local Leak Rate Testing of Purge Exhaust Penetration Valves, Rev. 1, following maintenance (Work Order C2019995) to correct excessive AH-V-1A leakage;

- On February 10, operators performed 1300.3Q5, Quarterly Inservice Testing of CM-V-1/2/3/4 Valves during Normal Plant Operations, Interim Change 25281, following troubleshooting and replacement of relay 20X/CM-V3. Troubleshooting indicated this relay was a likely cause for valve CM-V-3 failing to operate during surveillance testing on February 9 (IR 878425);

- On February 24, operators performed OP-TM-211-271, Fill And Vent MU Pumps, Rev. 2, following scheduled preventive maintenance activities; and

- On February 25, operators performed OP-TM-211-208, IST of MU-P-1C, Rev. 3, following scheduled preventive maintenance activities and lubricating oil replacement.

b. Findings

Instrumentation for Containment System Leakage Tests Didn't Meet Code Requirements

Introduction: The inspectors identified that station personnel repeatedly used temperature instrumentation that did not meet accuracy and repeatability requirements specified in station procedures when performing reactor building leak rate testing (LRT).

Additionally, station personnel did not document the temperature instrument used to perform leakage rate testing for several reactor building penetrations. This finding was determined to be of very low safety significance (Green) and was characterized as a NCV of TS 6.8.5.

Description: On February 6, following corrective maintenance, operators performed local leak rate testing of AH-V-1A using OP-TM-823-251. The inspectors reviewed the completed test records and identified that the pyrometer used for this test did not meet accuracy and repeatability requirements specified in OP-TM-823-251 and the applicable regulatory code. Pyrometer accuracy was +/- 1.5°Fahrenheit (F) in lieu of the required +/- 1°F. Pyrometer repeatability was +/- 2°F in lieu of the required +/- 0.5°F.

The inspectors reviewed five of forty-four additional LRT procedures to determine the extent-of-condition for this issue. Pyrometer accuracy and repeatability requirements were similarly not met for four of the five procedures reviewed, affecting LRT accuracy for two additional containment isolation valves and seven additional containment penetrations (including the reactor building equipment hatch and reactor building personnel hatch). Procedures which used the “Flow Make-up” LRT method did not specify instrument accuracy requirements and station personnel didn’t document what temperature instruments were used for these procedures. This review demonstrated the problem was repetitive and affected the LRT of multiple reactor building containment penetrations. The inspectors determined this issue impacted the accuracy of periodic and post-maintenance containment penetration and valve LRT, thereby adversely impacting continued reasonable assurance of containment integrity. Due to the extent of the issue, engineers performed a bounding engineering evaluation to determine the potential impact that use of the noncompliant temperature instruments could have on the actual LRT results. Engineers determined the reactor building containment remained operable. Additional actions were initiated to identify the extent-of-condition for this LRT implementation deficiency. IR 892386 documented the inspectors’ concerns.

Analysis: Repeated use of temperature test equipment that did not meet procedure requirements for accuracy and repeatability when performing containment penetration LRT was a performance deficiency. Additionally, failure to document which temperature equipment was used for LRT was a related performance deficiency. Repeated failure to ensure test instruments met procedure and regulatory requirements was programmatic, affected multiple components, adversely affected LRT test accuracy, and consequently impacted the licensee’s ability to verify the reactor building containment barrier remained operable. This finding is more than minor because the issue is associated with the barrier performance reliability attribute of the Barrier Integrity cornerstone and adversely affected the associated cornerstone objective to provide reasonable assurance that the physical containment barrier protects the public from radionuclide releases. Failure to assure LRT accuracy limited the licensee’s ability to detect, evaluate, and resolve potential containment integrity degradation issues and thereby assure reliability.

The inspectors performed a Phase 1 analysis of this issue in accordance with NRC Manual Chapter 0609, Appendix A, Significance Determination of Reactor Inspection Findings for At-Power Situations. The inspectors concluded the finding was of very low safety significance because the finding did not represent an actual open pathway in the physical integrity of the reactor compartment and did not result in a loss of operability. This finding had a cross-cutting aspect in the area of Human Performance, Work

Practices component because station personnel repeatedly did not follow procedure requirements to verify material and special prerequisites were met prior to performing containment penetration LRT [H.4(b)].

Enforcement: TS 6.8.5 requires the Reactor Building Leakage Rate Testing Program to be implemented in accordance with NRC Regulatory Guide (RG) 1.163, Performance-Based Containment Leak-Test Program. NRC RG 1.163 endorses Nuclear Energy Institute (NEI) 94-01, Industry Guideline for Implementing Performance-Based Option of 10 CFR 50 Appendix J, and American National Standards Institute/American Nuclear Society (ANSI/ANS) 56.8-1994, Containment System Leakage Testing Requirements. ANSI/ANS 56.8-1994 establishes temperature instrument accuracy and repeatability requirements for LRT using both the pressure decay method and flow make-up method. Procedures OP-TM-823-251, OP-TM-823-252, 1303-11.17A, 1303-11.18.18A, and 1303-11.18.27 specify temperature instrument accuracy and repeatability requirements consistent with ANSI/ANS 56.8-1994 for performance of LRT on various containment valves and penetrations. Additionally, 10 CFR 50, Appendix B, Criterion XI, Test Control, requires test results to be documented to assure that test requirements have been satisfied.

Contrary to these requirements, on various dates from October 2007 until February 2009, station personnel did not properly implement containment penetration LRT procedures in that they used temperature instruments that did not meet accuracy and repeatability requirements. Additionally, by not documenting the temperature instruments, the test results did not adequately demonstrate that test requirements had been satisfied. This adversely affected the accuracy of LRT measurements for containment purge valves AH-V-1A/B/C/D, the reactor building equipment hatch, the reactor building personnel hatch, and containment penetrations 104, 105, 106, 210, and 211. Because this violation was of very low safety significance and was entered into the corrective action program (IR 892386), this violation is being treated as an NCV consistent with Section VI.A.1 of the NRC Enforcement Policy: **NCV 05000289/2009002-01, Instrument Accuracy Not Verified Prior to Performing Containment Penetration Local Leak Rate Testing**.

1R22 Surveillance Testing (71111.22 – 5 samples)

a. Inspection Scope

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 previous problems and trends, observation of pre-evolution briefings, and initiation/resolution of related IRs for selected surveillances.

- On March 4, 1300-3KA, IST of RR Pump ‘A’ and Valves, Rev. 2;
- On March 6, 1303-4.16, Emergency Power System, Rev. 119;
- On March 10, OP-TM-424-202, IST of EF-P-2B, Rev. 5;
- On March 10, OP-TM-424-252, IST Leakage Exam for EF-P-2B and CO-T-1A, Rev. 0; and
- On March 13, OP-TM-212-257, Venting DH Train B in ES Standby Mode, Rev. 2.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope (1 Training Evolution Sample)

The inspectors observed an emergency event training evolution conducted on March 3 at the Unit 1 control room simulator 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 Alert 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. Additional documents reviewed are listed in the Attachment.

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 2008.

- 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)

.1 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 Exelon's corrective action program. This review was accomplished by reviewing a list of daily IRs, reviewing selected IRs, attending daily screening meetings, and accessing Exelon's computerized corrective action program database.

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

a. Inspection Scope (1 sample)

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

b. Findings

No findings of significance were identified.

4OA3 Event Follow-up (71153 – 3 samples)

.1 Loss of Power to 'B' 120 Volt Vital Bus

a. Inspection Scope

At 3:55 p.m. on February 13, the 'B' vital 120 volt bus became deenergized when the 'B' inverter failed. Control and indication of several plant equipment components became unavailable. Affected equipment included loss of 'B' train residual heat removal (RHR) flow indication, 'B' High Pressure Injection (HPI) flow indication, control of various control building ventilation dampers and fire protection systems, 'B' heat sink protection system, 'B' train of various remote shutdown equipment, and condenser radiation monitor RM-A-5. Operators responded by declaring the 'B' RHR and 'B' HPI trains inoperable and applying the associated TS 72-hour shutdown limiting conditions of operation (LCO). In addition operators implemented OP-TM-AOP-016, Loss of VBB, Rev. 1, OP-TM-AOP-034, Loss of Control Building Cooling, Rev. 8, and several compensatory fire watches. The most restrictive condition was a requirement within OP-TM-AOP-034 that required the power plant to be shutdown if control building ventilation could not be restored within 5 hours.

Technicians completed repairs to the 'F' inverter, which were in progress at the time of the event, and reenergized VBB at 7:31 p.m. Operators sequentially restored control building ventilation, fire protection systems, and the other affected equipment. Operators declared 'B' RHR and 'B' HPI operable and exited the associated TS LCOs at 10:40 p.m. The inspectors reviewed various records, interviewed operators and technicians, and performed post restoration plant walkdowns to verify station personnel responded in accordance with TS requirements and station procedures. The inspectors verified plant safety systems were properly operated and restored to the normal standby alignment.

b. Findings

No findings of significance were identified.

.2 A' High Pressure Injection Train Inoperable Due to Weld Leak

a. Inspection Scope

Early on March 14, station personnel identified a five drop per minute leak from a weld on a 1/2 inch coupling on the process lines for flow transmitter MU-FT-1127. This transmitter provides indication of flow on one of four HPI lines (2 injection trains, with two injection lines per train). Operators rely on this flow indication when performing HPI throttling as directed by emergency operating procedures for events such as a large break loss of coolant accident (LOCA). The location of the leak was on an American Society of Mechanical Engineers (ASME) Class 2, seismic class 1 pipe. ASME code requirements do not permit Class 2 piping to have any through wall leakage.

Operators assessed the leak using OP-AA-108-115, declared the 'A' HPI train inoperable at 5:05 a.m., entered a 72-hour shutdown LCO in accordance with TS 3.3.2, and declared Orange on-line maintenance risk. TMI staffed the outage control center and promptly developed two parallel paths to correct the condition repair the weld to original design, and if weld repair was not successful, install a clamp over the leak. Station senior management, nuclear oversight, vendors, and corporate staff provided timely and comprehensive support.

The inspectors monitored the leaking piping, performed plant walkdowns to verify equipment alignment and assess overall plant risk conditions, interviewed station personnel, assessed command and control of plant activities, and reviewed records including operating logs, repair work orders, and engineering evaluations. The inspectors verified applicable TS requirements were met during the identification, repair, and restoration from the HPI system leak. All other maintenance activities which could potentially impact risk were cancelled and operators maintained the plant stable while investigation and repairs were performed. Communications and work coordination were good. The inspectors questioned why the designated protected equipment postings did not include electrical breakers for the sole remaining HPI flow path valves (MU-V-16C/D). Upon reviewing the protected equipment list further, the shift manager directed these valves be posted.

Engineers and welders inspected the weld site during excavation of the defect. Their preliminary conclusion was that the leak was due to deficient weld technique during original construction. The flaw was localized to one spot on the weld. No further indication of leakage from nearby HPI instrument lines was visible. The licensee prompt investigation of the leak included actions to evaluate potential extent-of-condition issues (IR 892853).

Following the weld repair, operators filled and vented the 'A' HPI train, which returned station on-line maintenance risk to Green. Engineers monitored for air voids during HPI system restoration and determined the remaining void (<.01 cubic feet) in the discharge piping did not impact operability. Post maintenance tests included visual verification of no leakage at full operating system pressure. At 2:05 a.m. on March 16, operators declared the 'A' HPI train operable and exited the TS LCO.

b. Findings

No findings of significance were identified.

.3 (Closed) Licensee Event Report (LER) 2008-001, Decay Heat River Water System Pump (DR-P-1B) Failed to Start

On February 12, 2008, decay heat river water pump DR-P-1B failed to start (IRs 735277 and 735778) due to a faulted starting relay (X relay) within electrical circuit breaker DR-P-1B-BK. Station personnel determined one of the coil wires on the X relay was not firmly anchored (deficient solder joint) to the coil beneath the factory-installed electrical seal. Laboratory analysis concluded the apparent cause was an isolated occurrence of a coil manufacturing defect. The control relay was replaced and DR-P-1B was successfully returned to service on February 13. This event was previously documented in NRC Inspection Report 05000289/2008002.

Engineers subsequently concluded DR-P-1B had been inoperable from January 25 to February 13, 2008. The inspectors noted that since October 2007, when the breaker containing the defective starting relay was installed, DR-P-1B had started successfully over 20 consecutive times. Maintenance records indicated the breaker had been properly inspected, maintained, and tested prior to installation of DR-P-1B. Based on direct visual inspections and review of the laboratory failure analysis, the inspectors determined the inoperable decay heat river water pump did not result from a licensee performance deficiency. The deficient solder joint weakened during each breaker actuation and eventually broke on February 12, 2008, due to the cumulative fatigue. The equipment failure could not have been avoided or detected by the licensee's quality assurance program or other related control measures. The inspectors performed a risk based assessment using the TMI Unit 1 probabilistic risk assessment model. The assessment assumed DR-P-1B was inoperable for 19 days, the likelihood of DR-P-1A being inoperable during this same period was low, and some recovery credit for licensee repair capabilities after identification was applied. The inspectors determined the risk significance of this issue was low to moderate safety significance.

TS 3.3.1.4, Cooling Water Systems, requires two decay heat river water pumps be operable. Further, TS 3.3.2 permits one of the two decay heat river water trains to be inoperable temporarily for component maintenance or testing. If the inoperable component and train are not restored to operable status within 72 hours, the reactor must be placed in a hot shutdown condition within 6 hours. Contrary to these requirements, DR-P-1B was inoperable from January 25 to February 13, 2008, and the reactor was not shutdown. The event had a potential safety consequence in that if the redundant pump (DR-P-1A) failed to operate during an accident, decay river cooling which supports the decay heat removal function would not be available.

Corrective actions included: (1) replacing the defective control relay; (2) performing an extent-of-condition review; (3) inspecting all the X relays from the same manufacturing lot; (4) revising applicable electrical inspection and testing procedures; and, (5) incorporating this failure into the manufacturer corrective action program. Because no licensee performance deficiency was identified, no enforcement action is warranted. In accordance with Section VII.B.6 of the NRC's Enforcement Policy, the NRC has chosen to exercise enforcement discretion and not issue a violation for this issue. Further, because licensee actions did not contribute to this violation, it will not be considered in the assessment process or NRC's Action Matrix. (EA-09-011)

4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel Activities

a. Inspection Scope

During the inspection period, the inspectors conducted the following observations of security force personnel and activities to verify that the activities were consistent with Exelon security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

- Multiple tours of operations within the central and secondary security alarm stations;
- Explosive detector equipment testing.
- Owner controlled area and protected area access control posts; and
- Other security officer posts including the ready room and compensatory posts.

These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. These observations were considered an integral part of the inspectors' normal plant status review and inspection activities.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On April 16, 2009, the resident inspectors presented the inspection results to Mr. William Noll and other members of the TMI staff who acknowledged the findings. The regional specialist inspection results were previously presented to members of Exelon management. The inspectors asked Exelon 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

T. Alvey	Manager, Operations Support
D. Atherholt	Manager, Regulatory Assurance
C. Baker	Manager, Chemistry
P. Bennett	Manager, Engineering
J. Blair	Supervisor, Shift Operations
B. Buckley	Operations Instructor (Exam Developer)
B. Carsky	Director, Site Engineering
R. Davis	Manager, Radiation Protection
D. DiVitore	Manager, Radiological Engineering
T. Dougherty	Plant Manager
D. Etheridge	Radiation Protection Technical Manager
T. Flemming	System Engineer
R. Godwin	Training
J. Heischman	Director, Maintenance
F. Kresser	System Engineer
W. Laudenbach	System Engineer
F. Linsenbach	Manager, OTSG Replacement Radiation Protection
T. Megill	Operations Instructor
A. Miller	Regulatory Assurance
D. Mohre	Manager, Security
J. Morrisey	Operations Instructor
P. Mussleman	Security Supervisor
D. Neff	Manager, Emergency Preparedness
W. Noll	Site Vice President
S. Queen	Director, Site Operations
T. Roberts	Radiation Protection Supervisor
DJ Schork	Licensed Operations Requalification Program Lead
J. Tesmer	Simulator Supervisor
L. Troiano	Operations Assistant
D. Trostle	Operations Security Analyst
L. Weir	Manager, Nuclear Oversight Services
C. Wend	Manager, Radiation Protection
M. Wyatt	Manager, Operations Training
H. Yeldell	Director, Work Management

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Closed

05000289/2009-002-01	NCV	Instrument Accuracy Not Verified Prior to Performing Containment Penetration Local Leak Rate Testing (Section 1R19)
05000289/2008-001	LER	Decay Heat River Water System Pump (DR-P-1B) Failed to Start (Section 4OA3.3)

09-011	EA	Decay River Pump Inoperable Longer than Allowed by Technical Specifications (Section 4OA3.3)

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

Procedures

1107-2A, Emergency Electrical – 4KV and 480 Volt, Rev. 19
OP-TM-533-000, Decay Heat River System, Interim Change 25878
OP-TM-543-000, Decay Heat Closed System, Rev. 8
OP-TM-211-432, Removing MU-P-1C from Service, Rev. 3

Drawings

302-640, Decay Heat Removal System, Rev. 82
302-660, Makeup & Purification System, Rev. 44
302-661, Makeup & Purification System, Rev. 59
302-712, Reactor Building Spray System, Rev. 49
302-844, Turbine Building, Diesel Generator System and Outbuildings H&V Flow Diagram, Rev. 35

Other Documents

IR 884860, Disposition of Voiding in the MU-P-1C Suction Line
IR 866794, Air Void in 'B' Decay Heat Pump Discharge

Section 1R011: Licensed Operator Requalification Program

Procedures

EP-AA-1009, Radiological Emergency Plan Annex for TMI Station, Rev. 12
OP-TM-AOP-003, Earthquake, Rev. 0
OP-TM-AOP-013, Loss of 1D 4160V Bus, Rev. 5
OP-TM-AOP-028, Loss of Instrument Air, Rev. 4
OP-TM-AOP-041, Loss of Seal Injection, Rev. 4
OP-TM-AOP-051, Secondary Side High Energy Leak, Rev. 0
OP-TM-AOP-062, Inoperable Rod, Rev. 2
OP-TM-EOP-001, Reactor Trip, Rev. 10
OP-TM-EOP-004, Lack of Primary to Secondary Heat Transfer, Rev. 6
OP-TM-EOP-010, Abnormal Transients Rules, Guides, and Graphs, Rev. 10
OS-24, Conduct of Operations During Abnormal and Emergency Events, Rev. 17

Other Documents Reviewed

IR 891734
IR 892155
IR 892134
IR 882525
End of Cycle Report 09-01

Training and Other Procedures

TQA-AA-150, Operator Training Programs, Rev. 1
TQ-AA-306, Simulator Management, Rev. 0

Written Exams
Week 1 RO and SRO
Week 2 RO and SRO
Week 3 RO and SRO

TMI LOR Operational Simulator Scenario (11.7.10)
No. 1, Revision 14
No. 2, Revision 10
No. 3, Revision 10
No. 9, Revision 11
No. 18, Revision 11
No. 13, Revision 11
No. 22, Revision 8
No. 25, Revision 6
No. 31, Revision 10
No. 37, Revision 7

Job Performance Measures

TQ-TM-104-EPAA-J001-20	TQ-TM-104-E20-J003
TQ-TM-104-EPAA-J001-19	TQ-TM-104-A25-J003
TQ-TM-104-211-J003	TQ-TM-104-826-J002
TQ-TM-105-EOP10-J001	TQ-TM-105-424-J004
TQ-TM-105- EOP10-J003	TQ-TM-104-731-J001

Simulator Documents
SWR 11572, Investigate Bearing Temperatures at High Flow
SSP01, Simulator Stability Certification Test (07-08)
SSP02, Simulator Accuracy Certification Test (07-08)
TTS35, Turbine Trip Certification Test (07-08)
TTS42, Main Steam Leak Inside Reactor Building Certification Test (04-05), (07-08)
TTS18, ED09B Inverter Failure Malfunction Test (07-08)
TTS15, ED06N 1S 480V Bus Fault (07-08)
TS33, Inability to Drive Rods Certification Test (08-09)
OES24, LER Test Comparing Sim to Plant for Nov 2006 Reactor Trip
TTS41, Reactor Trip Certification Test (08-09)
Simulator Test Review Board Minutes, Mar 5, 2007
IR 836296, Source Range NI Response
TQ-AP-303-0101, PWR Moderator Temperature Coefficient of Reactivity Test (Cycle 17)
TQ-AP-303-0102, PWR Rod Worth Coefficient of Reactivity Test (Cycle 17)
TQ-AP-303-0103, PWR Boron Coefficient of Reactivity Test (Cycle 17)
TQ-AP-303-0105, PWR Approach to Criticality Using Control Rods (Cycle 17)
TQ-AP-303-0105, PWR Approach to Criticality Using Control Rods (Cycle 17)
TQ-AP-303-0106, PWR Differential Boron Coefficient of Reactivity (Cycle 17)
TQ-AP-303-0107, PWR Fuel and Power Doppler Coefficient of Reactivity (Cycle 17)
1550-02, Zero Power Physics Testing (as run on simulator 5/24/07)
WR9201, Reactor Building Sump Modification (ECR 06-00206)

Section 1R018: Plant Modifications
Procedures
OP-TM-EOP-005, OTSG Tube Leakage, Rev. 6

OP-TM-EOP-006, LOCA Cooldown, Rev. 7
OP-TM-EOP-010, Emergency Procedure Rules, Guides, and Graphs, Rev. 10

Other Documents
AR-A2197967, Perform Material Seismic Report for ECR 08-607
SQTS-01-GSQTP, Equipment Seismic Testing Summary Data Sheet, Rev. 1
UFSAR Section 6.1, Emergency Core Cooling System

Section 1R19: Post-Maintenance Testing
Procedures
ER-AA-380, Primary Containment Leak Rate Testing Program, Rev. 5
ER-TM-380-1001, TMI-1 Reactor Building Leakage Rate Testing Program, Rev. 0
OP-TM-823-252, Local Leak Rate Testing of Purge Supply Penetration Valves, Rev. 3
1303-11.17A, RB Local Leak Rate Testing – RB Access Hatches, Rev. 1
1303-11.18.18A, LRT of Penetrations 104, 105, 106, 210, and 211, Rev. 1
1303-11.18.27, LRT of Equipment Hatch Flange Interspace, Rev. 1

Section 1R22: Surveillance Test
Procedures
OP-TM-424-252, IST Leakage Exam for EF-P-2B and CO-T-1A, Rev. 0
OP-TM-424-202, IST of EF-P-2B, Rev. 5

Other Documents
IR 00891243, NRC: Questions/Concerns With OP-TM-424-252
IR 00891223, NRC: Concerns With FB Members and Other Duties
IR 00891216, NRC: Fluctuations With EFW Gauges During IST

Section 1EP6: Drill Evaluation
Procedures
EP-AA-1009, Radiological Emergency Plan Annex for TMI Station, Rev. 13
OP-TM-EOP-001, Reactor Trip, Rev. 10
OP-TM-EOP-003, Excessive Primary to Secondary Heat Transfer, Rev. 6
OP-TM-EOP-005, OTSG Tube Leakage, Rev. 6
OP-TM-EOP-010, Abnormal Transients Rules, Guides, and Graphs, Rev. 10
TMI Unit 1 Operational Simulator Scenario No. 31, Failed Open Pressurizer Spray Valve During Plant Startup, Loss of Main Feedwater, and OTSG Tube Rupture, Rev. 10

Section 4OA3: Event Follow-up
Procedures
OP-TM-AOP-016, Loss of Vital Bus ‘B’, Rev. 1
OP-TM-AOP-034, Loss of Control Building Cooling, Rev. 8

Drawings
302-661, Make-up and Purification Flow Diagram, Rev. 59
B-308-514, Reactor Coolant Pumps Seal Injection Flow 7 Filter - Pressure Transmitters, Rev. 5

Other
Issue Reports 880641, 880660, 880647, 880675, 882218, 892853
MU-V-1034 Repair Schedule, Rev. 9
Work Order C2020806, Repair Leak at MU-V-1034 Inlet Pipe
Work Order R2122952, Inspection of Make-up System For Voids

Attachment 8, Protected Equipment Log – HPI 'A' Train Inoperable
ASME Code Case N-523-2, Mechanical Clamping Devices for Class 2 and 3 Piping, Section XI, Division I

LIST OF ACRONYMS

ADAMS	Agencywide Documents and Management System
ANS	American Nuclear Society
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
DH	Decay Heat
DR	Decay River Water
DRP	Division of Reactor Projects
ECR	Engineering Change Request
EDG	Emergency Diesel Generator
EFW	Emergency Feed Water
ESAS	Engineered Safeguards and Actuation System
HPI	High Pressure Injection
IMC	Inspection Manual Chapter
IR	Issue Report
JPM	Job Performance Measures
LCO	Limiting Conditions of Operation
LER	Licensee Event Report
LOCA	Loss of Coolant Accident
LOR	Licensed Operator Requalification
LRT	Leak Rate Testing
MR	Maintenance Rule
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OWA	Operator Workaround
PARS	Publicly Available Records
PI	Performance Indicator
PMT	Post-Maintenance Test
RG	Regulatory Guide
RHR	Residual Heat Removal
SDP	Significance Determination Process
SSC	Structures, Systems, and Components
TMI	Three Mile Island, Unit 1
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
VBB	Vital Bus 'B'